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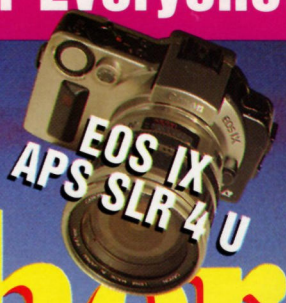

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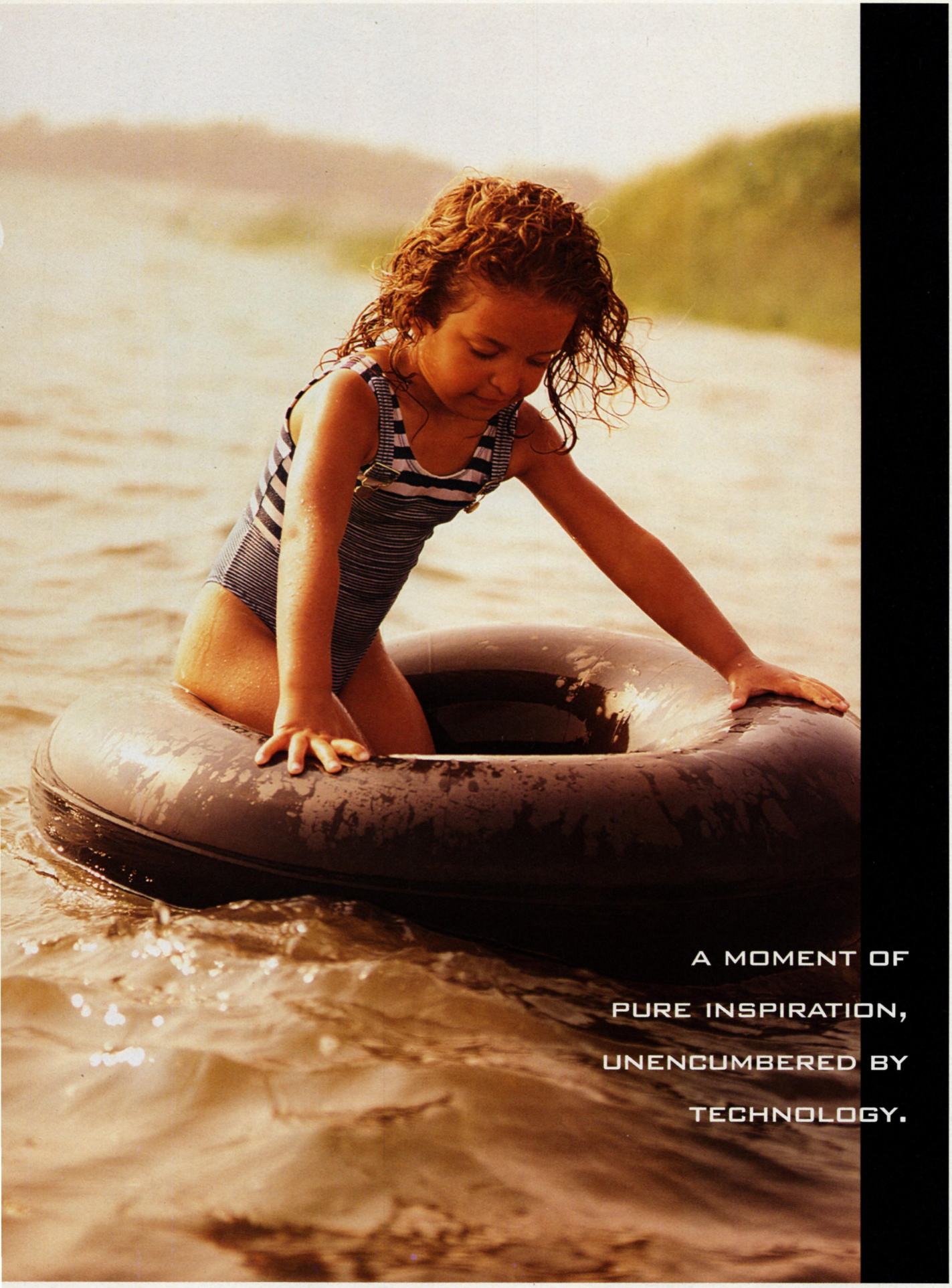

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Outdoor Photographer

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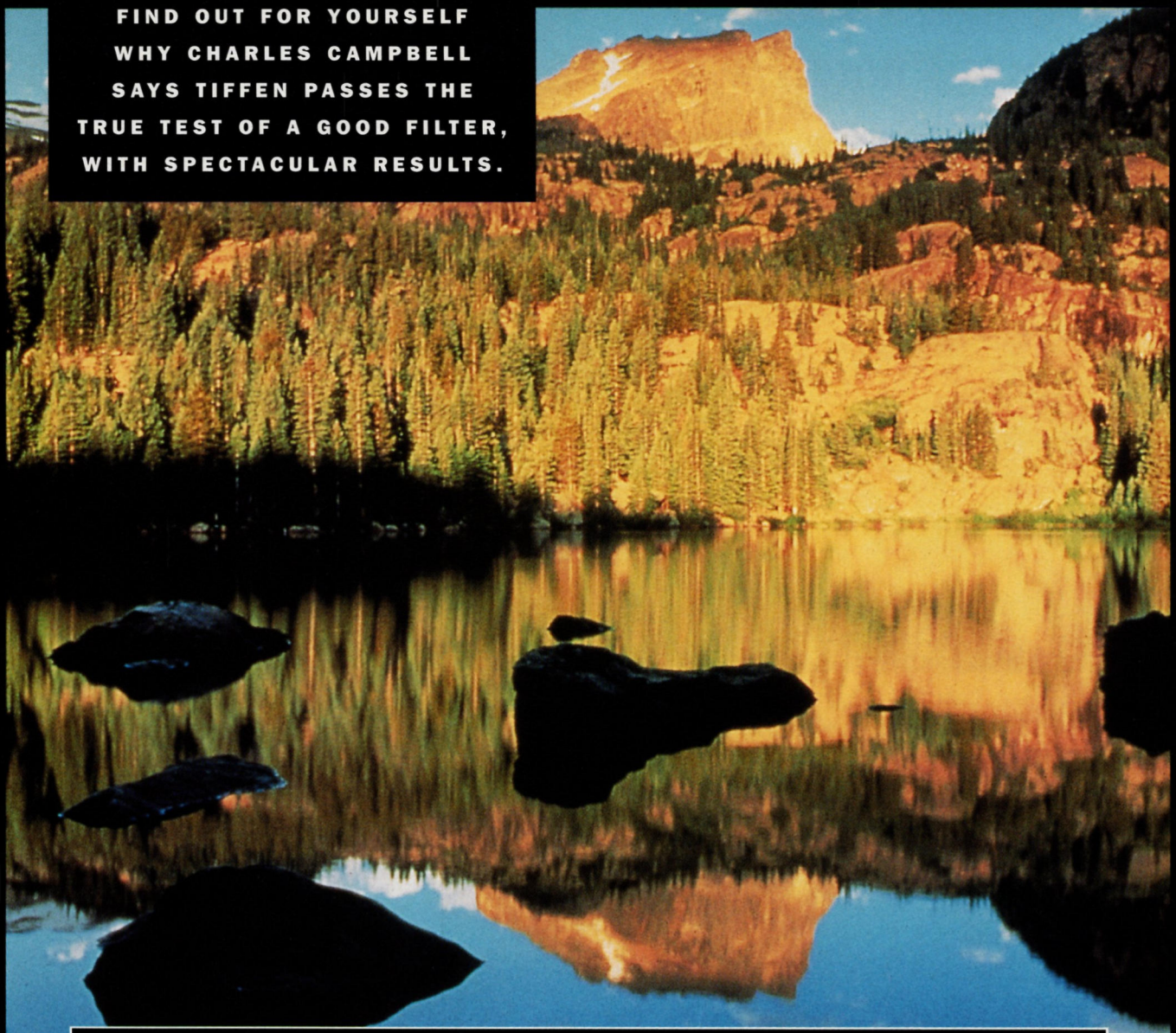
FIND OUT FOR YOURSELF WHY CHARLES CAMPBELL SAYS TIFFEN PASSES THE TRUE TEST OF A GOOD FILTER, WITH SPECTACULAR RESULTS.



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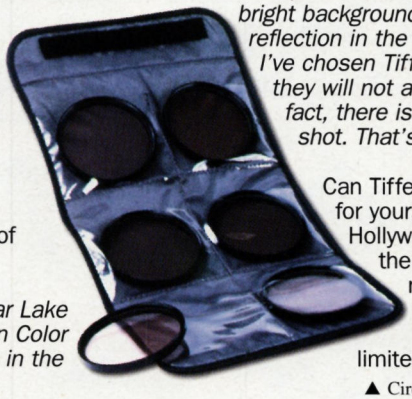

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Outdoor Photographer

LAKE SUPERIOR/GARY MCGUFFIN, *SUPERIOR* (NORTHWORD PRESS)

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In Memoriam
Jack A. Thompson (1913-1996)

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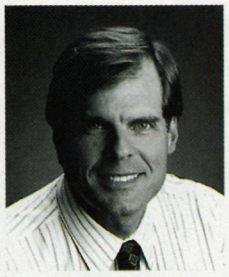


A couple of Mays ago, I was in Toronto where a long winter was lingering on, vacillating between a wet snow and a very cold rain in contrast to the summer-like California weather I had left behind. In a bookstore, I couldn't help but notice an extra-large stack of *Islands* magazines with an alluring tropical cover and was struck by a new appreciation for how a magazine's subject matter is received in places where winters can be protracted. While snow is a novelty to Southern Californians, a magazine publisher has to question how it plays to the magazine-rack audience elsewhere. Therein lies the influence on the content and cover of this winter issue.

Our emphasis on the icy or wide-open North Country (Robert Glenn Ketchum and Paul Souders), along with fun and photos in snow country (Judy Holmes) is offset by the sparkling wave sport (Woody Woodworth) of another climate. All have their purpose and, we hope, their attraction to readers at this time of year. Our Alaskan cover is intentionally chosen as a more inviting spring-like scene that only suggests the snows of a past winter.

In terms of trip planning, those inspired by Ketchum's extraordinary Northwest Passage expedition or Souders' distinctly more doable Dalton Highway tour, will need to get started on bookings ASAP. In the context of adventure travel, Ketchum's ocean-to-ocean journey and photographic opportunity was unique, to say the least, and impossible to most of us.

William Simon (former Secretary of the Treasury and wealthy businessman) outfitted a personal icebreaker of sorts complete with observation helicopter, then invited close friends and four esteemed guests: Ketchum the photographer, John Bockstoce the author with arctic expertise and both the president and vice president of the Explorer's Club as the eminent marine biologists.

Not everyman's arctic cruise ship, but a supreme "viewfinder" for Robert Glenn Ketchum.

Ketchum points out that there's certainly historical precedent for such patronage lavished on landscape artists. William Henry Jackson was supported in part by such philanthropists as Averell Harriman and J. Pierpont Morgan. The owners of the railways were supportive of survey photographers for it was in their interest to encourage travelers to venture west, by railroad, of course. Jackson had his own railroad car, using it like an apartment and base of operation. As a patron in similar fashion, William Simon was committed to the expedition for personal reasons, but not just for himself, thereby supporting a higher artistic and scientific purpose.

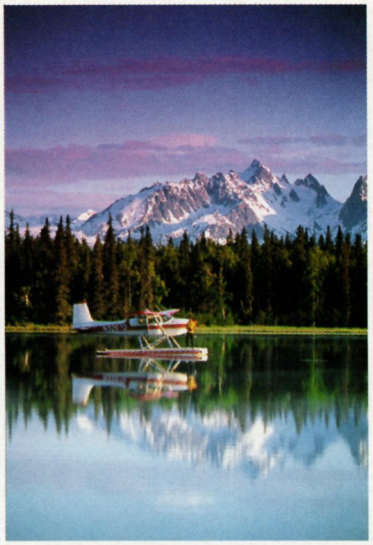
Now back to Earth. Souders presents the newly open to the public Dalton Highway as the ultimate drive-yourself Alaska tour through the state's vast and remote terrain. Closer to home, Holmes gives her clinic on delightful (not gray) winter scenics, with suggestions on how to dress for success. To that we add our own guide to snowshoes, the can-do alternative for exploring the winter backcountry.

For a refreshing alternative to all this snow and ice and arctic mountains, Woodworth provides a splash of surfside entertainment with his dolphin's-eye view of inside the tube. Apart from being a winter diversion, there's good rationale for this work in this season, for this "off season" is when it's "high season" for big surf and sharp, stunning light. As an aside, we were awed by how the still photograph freezes liquid waves into seemingly rigid forms of Venetian glass upon which surfers balance and brace themselves—an example of how a photograph provides us with unlimited time to study a fleeting subject.

Finally, the issue finishes with a glimpse of the new sport where winter meets summer: kayak-skiing.

—Steve Werner, Publisher

COVER SHOT



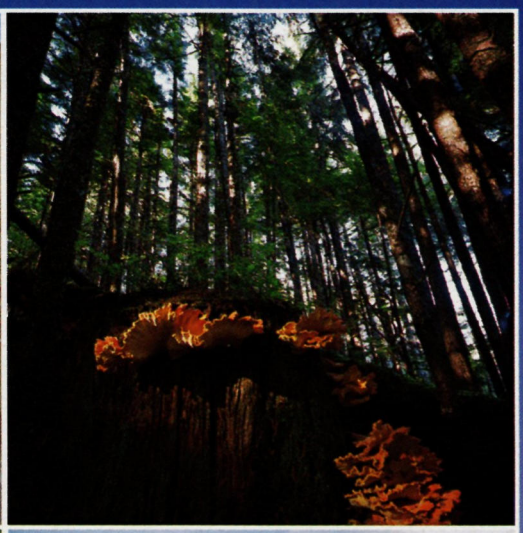
Photographer: Jeff Schultz
Subject: Float Plane and Mountains, Southeastern Alaska
Equipment: Canon EOS-1, Canon EF 80-200mm *f*/2.8, Fujichrome 100
Situation: I had always wanted to get a shot of a float plane with some of our majestic Alaskan mountains in the background. Fortunately, a friend of mine who owns such a plane was amenable to helping me out.

He and I had flown around in the Talkeetna and Alaska mountain ranges in May, looking for interesting lakes and marking their positions with a Loran (an instrument that uses satellites to determine your position), so the locations would be easy to return to. One of these lakes looked especially good so, about a month later, we decided to head back to it.

In Alaska, the summer days of early June have sunlight for about 20 hours, so we had to get up around 3:30 a.m. to get the light I wanted. Because the lake is one of many that are unnamed in this region west of Talkeetna, we relied on the Loran to get us there. These days, a modern GPS (Global Positioning System) instrument would make finding it even easier.

When we arrived, I set up the camera from a vantage point that gave a little height over the lake. Then I used a CB radio to direct the pilot into position for the shot. When he stepped out on the float with the fishing pole, everything was just right.

"It's Only Natural"



Judy Holmes

Premier outdoor photographer Judy Holmes spends much of her time working in some of the most remote, unforgiving locations on earth, under conditions that place great demands on both her and her equipment. "If you're going to invest the kind of time and effort necessary to get great outdoor shots, it's only natural to invest in the best photographic equipment, clothing and film available:"

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For more information on Judy Holmes' Programs including outdoor workshops and Hasselblad University, call Summit House Photography at 610-527-0321.

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Contest Winners

There was such an overwhelming response to the LowePro/Spirit Bear Endangered Spaces contest, and so many great entries, that the judging process has taken longer than we had anticipated. Our thanks to everyone who sent images. Be sure to look for the winners in the March issue of *OP*.

The Vultures Are Circling

The photographs on page 84 of the November, 1996 issue, identified as a turkey vulture (Cathartes aura), are actually an adult black vulture (Coragyps atratus). Immature turkey vultures, like adult black vultures, have all-black heads, and this may have led to the confusion. Of course, an adult turkey vulture has an all-red head.

Brian E. Small
Los Angeles, California

Lemurs And Long Jumpers

Our article about the similarities between shooting action shots of human athletes and wildlife was missing three photo credits. The picture of the rugby players was taken by David Rogers/Allsport, the one of the fly-fisherman was by Nathan Bilow/Allsport and the shot of the speed walkers was made by Bob Martin/Allsport.

More Composites

In the years to come, digital photography and manipulation will become the standard method of producing photographic images. I don't see the point that this will mean the end of true photography. On the contrary, as a tool, computers will be a means for many image-makers to achieve their visions by overcoming the limitations inherent in film, cameras, etc.

The only aspect of this revolution that makes me a bit sad is in the area of digital composites. In a sense, photographers have always been at least as much craftsmen as we have been artists. It has been said that luck is what happens when skill meets preparation—this is true in photography. Digital composites make it much easier to make an image without that careful preparation. I'll be a bit sad when someone looks at my photographs in the future and wonders if they were composited on a computer. I'm proud of the level of traditional craftsmanship that I bring to my images. Ultimately, it doesn't make them better or worse than the same thing made with a computer, but maybe it makes them a little more personal.

Niki Lazarro
Pasadena, California

Ex Officio

In the November, 1996 "Gadget Bag" on photo vests, we accidentally listed Ex Officio's fax number instead of the voice telephone number. To speak with a person at Ex Officio, call (206) 283-1471.

Cotton Candy Streams

Photos of flowing water that look like cotton candy still don't turn me on. I don't know who started the trend, but it looks like just about everyone is getting into the "fad." I want my water shots to look like water, not something it isn't. Of course, very few editors will accept slides with water that looks like water because that's the way the pros say it should be because that's the way they shoot.

Ralph A. Fisher Jr.
Silver City, New Mexico

Making flowing water look like "cotton candy" is as old as photographs of flowing water. Then, as now, photography is a trade-off. In this case, it's between the small f-stop required for sufficient depth of field and the fast shutter speed required for water stopping ability. You just can't get both. Many photographers, therefore, opt for the "cotton candy" effect. We'd disagree that editors only accept water rendered this way. We don't reject images of sharply photographed water on that basis alone. Rather, we simply tend to see more superior images with it than with tack-sharp water.

Please address inquiries to: Letters to the Editor, OUTDOOR PHOTOGRAPHER Magazine, 12121 Wilshire Blvd., Suite 1200, Los Angeles, CA 90025-1175, or e-mail us at OPMagazine@aol.com (editorial matters only). For subscription concerns, call (800) 283-4410.

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Hewlett-Packard has combined new premium papers and its photo resolution enhancement technology (PhotoRET) to give you some of the best quality images to date on a desk-top printer. PhotoRET uses new ink cartridges, hardware and software available for the first time in the 690C series of printers. And it really works!

The 693C comes with the HP Home Project Kit (a raft of software to make fun home projects like cards, magnets, calendars and more, as well as other family-oriented activities) and lists for $349. The 690C is the same, but without the Home Project Kit, and lists for $329. And through January 15, 1997, Hewlett-Packard is offering a rebate for the full value of the optional HP photo color kit ($49) with the purchase of a DeskJet 693C.

For more information, contact: Hewlett-Packard, 3000 Hanover St., Palo Alto, CA 94304, (415) 857-1501.

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Carbon fiber is a very strong, rigid space-age material that's 30 percent lighter than its equivalent in aluminum. **Gitzo has now expanded its use of this high-tech material in its Mountaineer series tripods.**

For example, the Gitzo Mountaineer G1338 folds down to 27⅛ inches and extends to a maximum height of 59 inches. The tripod can be lowered to just 15⅝ inches from the ground, will support loads up to 26½ pounds and weighs a scant 4⅝ pounds!

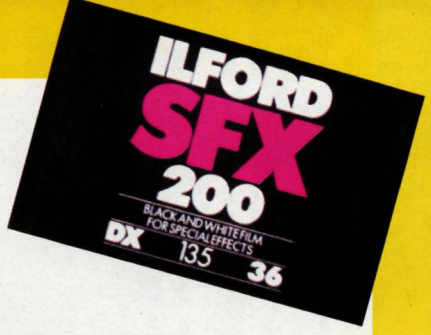
For more information, contact: Bogen Photo Corp., P.O. Box 506, 565 E. Crescent Ave., Ramsey, NJ 07446, (201) 818-9500.

Olympus Centurion

Higher-end Advanced Photo System cameras continue to make their way into the marketplace. **The New Olympus Centurion is being billed as the flagship of the Olympus line.** The lightweight camera body (16 ounces) features a 25-100mm zoom lens (approximately 32-125mm in 35mm terms).

The Centurion has four automatic exposure modes, including stop-action, portrait, night scene and landscape. There's also a built-in, pop-up flash that can be set for auto-flash, red-eye reduction, fill-flash and no-flash operation. A Super FP flash setting for the portrait mode allows you to choose a higher-than-normal shutter speed and, thus, a larger aperture for throwing the background out of focus. A backlit LCD panel is easy to read in low light and shows you all the pertinent information about the camera's settings. The camera records exposure information on the APS film's transparent magnetic layer, including the date and time of the exposure. List price: $1,000.

For more information, contact: Olympus America, Inc., 2 Corporate Center Dr., Melville, NY 11747, (516) 844-5000.

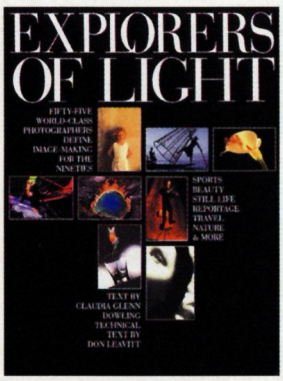


Ilford SFX

Infrared film effects can be very dramatic. Foliage, skies and even people in the shot can have an otherworldly look; unfortunately, infrared film can be a pain to work with.

Enter the new Ilford SFX, an ISO 200 film that has extended sensitivity to the red portion of the visible spectrum. Because it's not a true infrared film, it doesn't require special handling. It can be developed in ordinary chemistry, and your lens doesn't need any special adjustment. For the most dramatic effects, you might use it with a deep red filter.

For more information, contact: Ilford Photo, W. 70 Century Rd., P.O. Box 288, Paramus, NJ 07653, (201) 265-6000.



Books And Such

The Art Of Adventure, Galen Rowell (Sierra Club Books, 85 Second St., San Francisco, CA 94105, (415) 977-5500). The vision and powerful images of *Outdoor Photographer* columnist Galen Rowell are now available in paperback.

The Complete Guide To Selling Your Work, Lee Frost (Sterling Publishing Co., Inc., 387 Park Ave. S., New York, NY 10016, (212) 532-7160). Answers to a multitude of questions about receiving remuneration for your photographs.

Explorers Of Light (Canon USA, Inc., 1 Canon Plaza, Lake Success, NY 11042, (516) 488-6700). A collection of 55 of the best photographers in the world, with some of the pictures that have made them great.

The Nikon System Handbook, 4th edition, B. Moose Peterson (Silver Pixel Press, 21 Jet View Dr., Rochester, NY 14624, (716) 328-7800). Chock-full of information to help you get the most out of your Nikon.

You Just Have To Love Bears (P.S. Hemingway Productions, P.O. Box 7106, Ocean Park, ME 04063). A must-view video for anyone traveling into bear country, detailing how to minimize problems and enhance the enjoyment of bears.

New Kodak Films

Never content to rest on its laurels, **Kodak has three new Royal Gold films that take the quality we've come to expect from Royal Gold a step further.** Available in ISO 100, 200 and 400, the films employ T-Grain technology in the emulsions to make what Kodak calls its "ultimate" grain films.

The new Royal Golds also incorporate technology developed for the Advantix films of the Advanced Photo System (APS). Due to the smaller film size, APS films required new emulsion and coating technology to maximize their resolution, and the new 35mm Royal Golds have those superior coatings.

For more information, contact: Eastman Kodak, Inc., 343 State St., Rochester, NY 14650, (716) 724-4000.

Lens News

Tamron—SP AF28-105mm *f*/2.8 LD Aspherical (IF): A highly compact, fast, constant aperture zoom that covers the most popular focal lengths.

PE100-220mm *f*/4.8 Aspherical (IF) Zoom lens for Bronica ETRSi medium-format cameras: A new zoom for Bronicas based on Tamron's experience at designing solid, sharp zooms.

For more information, contact: Tamron Industries, Inc., 125 Schmitt Blvd., Farmingdale, NY 11735, (516) 694-8700.

Sigma—Ultra Tele Apo Zoom 170-500mm *f*/5-6.3 Aspherical: A new zoom that covers a range that most wildlife photographers wish they had.

Ultra Tele Apo Zoom 135-400mm *f*/4.5-5.6 Aspherical: A bit faster than the 170-500mm, this zoom has a great range for landscape and wildlife photography.

For more information, contact: Sigma Corp. of America, 15 Fleetwood Ct., Ronkonkoma, NY 11779, (516) 585-1144.

Pentax—SMC Pentax-FA Zoom 28-200mm *f*/3.8-5.6 AL (IF): Pentax's foray into the ever-broadening arena of extreme zooms has both a huge range, as well as a very compact design.

For more information, contact: Pentax, 35 Inverness Dr. E., P.O. Box 6509, Englewood, CO 80155, (303) 799-8000.

Leica—80-200mm *f*/4 Vario-Elmarit-R: For the Leica SLR line, this new zoom replaces the 70-210mm *f*/4 Vario-Elmarit-R and promises the great sharpness and contrast for which Leica is so renowned.

For more information, contact: Leica Camera Inc., 156 Ludlow Ave., Northvale, NJ 07647, (201) 767-7500.

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Outdoor Photographer Magazine

A Letter From The Publisher...

Dear *Outdoor Photographer* Reader:

We're very pleased to announce a new program designed to give you, the advanced amateur photographer, an exciting and effective way to make the most of your photographic and travel dollars.

The *Outdoor Photographer* VISA Card

Careful thought and planning have gone into developing this program! It links a competitively priced credit card with attractive photography-related products and services uniquely crafted to your style of photography. And, there are two other, very valuable, travel-related benefits tied to use of the card. This combination offers real benefits to those photographers who actively use the *Outdoor Photographer* VISA.

This is a great card offer! The *Outdoor Photographer* VISA is being issued with an introductory rate of 10.25% until July 1, 1997, and with **no annual fee.** In addition, the card has many other free benefits, including $100,000 Common Carrier Travel Insurance, Emergency Card Replacement and Cash Services and a free second card for your spouse or other household member.

One of our main objectives was simplicity! We chose a simple approach to cardholder rewards: Use your *Outdoor Photographer* VISA to purchase from any *Outdoor Photographer* Enhancements and you easily access their special offer. And more special offers will be coming your way!

We thought of traveling convenience, too! The *Outdoor Photographer* VISA includes a direct-access long distance calling service **without carrying an additional card.** The instructions for accessing the service are on the back of the card, and the system uses voice prompts to guide you through its operation. This service allows you to make long-distance calls from nearly anywhere in the United States at a flat rate of 18.9¢ per minute. And, your calls are automatically billed to your card account on a monthly basis. No extra phone bill to pay!

The *Outdoor Photographer* VISA can make traveling pay! Cardholders may join the Dining à la Card service, which provides direct 20% cash rebates on your first purchase each month at participating restaurants, hotels, motels and bed & breakfast inns (and you can repeat this rebate each month). Better still, once you enroll, this enhancement is completely automatic and requires **no additional card** or notification on your part. To help with travel planning, full information, including listings of participating merchants, will be sent to you when you enroll for a free, three-month trial period.

We won't let you miss out! To keep you up to date on the program and to make sure you don't miss any information vital to your enjoyment of photography, you may automatically put your annual *Outdoor Photographer* Magazine subscription renewal directly on your *Outdoor Photographer* VISA.

We're truly delighted that we're able to offer this program to our readers and hope you'll take a moment to review the facing ad and fill out the application. If you have any questions or comments about this program, or if somebody has already used the application, please call **1-800-927-0380** and we will gladly send you another copy.

We know you'll be very pleased with your *Outdoor Photographer* VISA, and we want to thank you for your continued support!

Sincerely,

Steven D. Werner, Publisher
Outdoor Photographer

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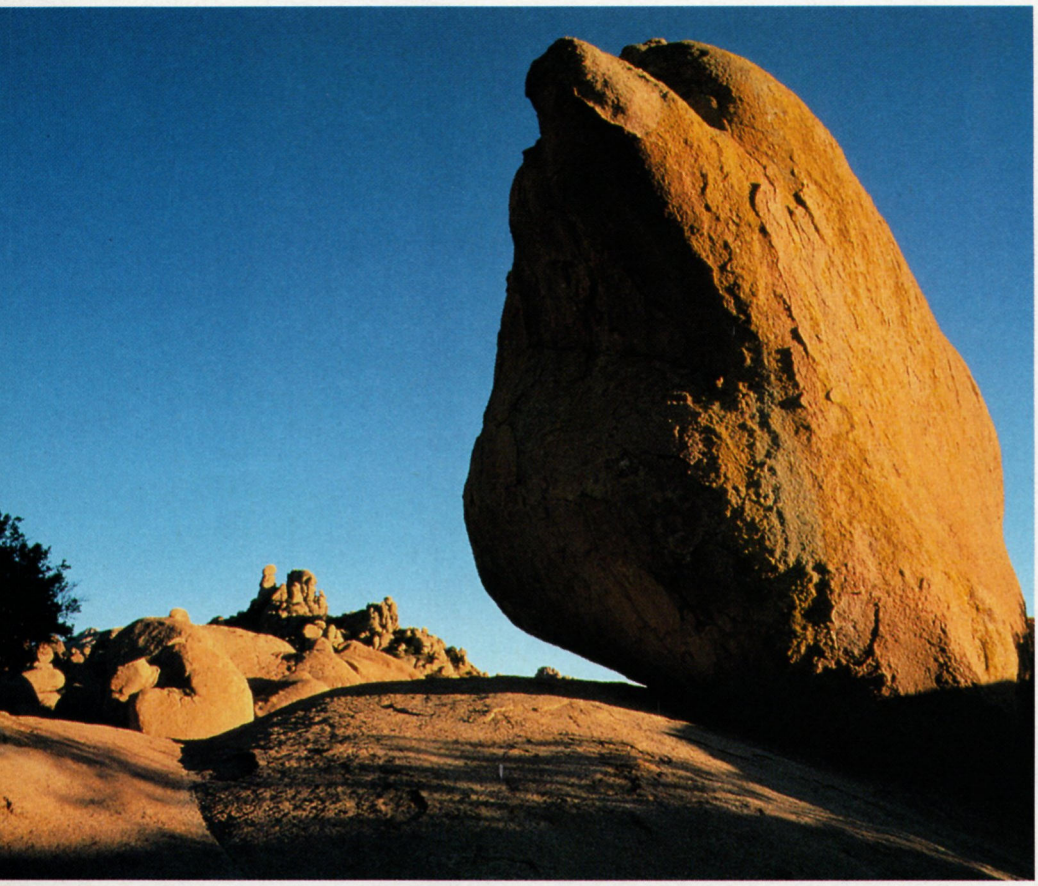
Outdoor Photographer VISA photograph by Christopher Talbot Frank.



The Dragoon Mountains

Text And Photography By George Stocking

Location: Thrust up from the sagebrush desert plains of southeastern Arizona, the Dragoon Mountains are flanked on the east by the Huachuca Range and on the west by the Chiricahua Range. Rising to 7519 feet, these mountains once provided sanctuary to Cochise and his Apache warriors as he waged war against the U.S. Army. They now provide the photographer sanctuary from the more popular and over-photographed Arizona destinations.

The Dragoons are a maze of granite spires, yawning crevices and abrupt precipices. Balancing rocks and boulders the size of small houses are sprinkled across steep hillsides. The wheaten grasslands are dotted with huge oaks. Soaptree yucca and Parry's agave break the profile of the flowing grass, along with a few chainfruit cholla cactus. The steep washes are lined with tall sycamores trees and an occasional cottonwood.

The range abounds with wildlife. Mule deer feast in the fields of tall grass. Many species of raptors can be spotted circling overhead as they search for a meal. Fox, bobcats and coyotes prowl the rocky hillsides. Javelina are often spotted in the washes and around the springs. Snakes and lizards can be found in abundance, most notably, the diamondback rattlesnake.

In the Dragoons, all things seem to begin and end at the two geographically opposed box canyons, called "strongholds" in deference to the historical Apache presence. The eastern side of the range is home to Cochise's Stronghold, also the site of the Apache chieftain's death. Possibly the most beautiful spot in the range, the towering rock faces are almost completely hidden by a splendidly wooded canyon, which can be accessed via steep hiking trails.

As beautiful as the Cochise Stronghold is, it's the western side of the range that inspires my creative spirit. A washboarded dirt road winds along the base of the mountain, providing access to the steep canyons and grass-covered plains, eventually dead-ending at the West Stronghold. From there, hikers can climb the steep trails and descend into Cochise Stronghold in the east, if they choose.

To access Cochise Stronghold, take I-10 south from Tucson and exit south onto SR 191. At the town of Sunsites, turn right at the sign for the stronghold. For the West Stronghold, exit I-10 south on SR 80. Turn left on Middlemarch Road about one mile north of Tombstone. Proceed until a sign indicates a left turn to the West Stronghold.

Weather: Summer can be very hot, with temperatures often exceeding 100° F. Precautions should be taken to avoid heatstroke and dehydration. Fall and spring are mild, with daytime temperatures averaging about 80° F. Temperatures in winter will often drop below freezing at night, and snowfalls on the 7500-foot peaks aren't uncommon.

Photo Experience: Generally, I use my widest lenses in the boulder fields, but sometimes compress them with a medium telephoto for a different perspective. The grasslands have provided some of my favorite images, usually requiring wide angle to normal focal lengths. Opportunities for close-up work abound, so macro lenses and extension tubes are a must. Wildlife in the range isn't habituated to human presence and is actively hunted during season, so the longest focal length lenses are needed.

Fujichrome Velvia is my usual film choice for capturing the late light and alpenglow on the mountainsides. Kodak's Ektachrome X 100 (EPZ) and E100SW made the grasslands glow with a wonderful golden hue. Wildlife might necessitate faster films, such as Kodak's new Elite II (ISO 200). **OP**

BEST TIMES Wildflowers begin appearing in late April and continue to proliferate through May. Barrel and cholla cactus bloom from late May through early summer. Summers with heavy monsoon activity will generate wildflowers around August. Late-afternoon monsoons also make for powerful sunsets on the western side of the range. The leaves on the sycamore and cottonwood trees begin changing around the middle of November, creating fabulous color displays. Winter is my favorite season to photograph, when snow adorns the highest peaks. Heavy frost covering the grass and thistle provide wonderful photo opportunities in the early-morning hours.

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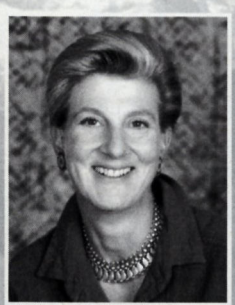
Visual Journeys

Creativity and Adventure in Travel Photography

Sponsored by Outdoor Photographer, Lisl Dennis and Nevada Wier are back with Visual Journeys, a one-day seminar on travel photography, including AV shows, video programming and slides from around the globe. Authors, instructors for Santa Fe Workshops and trip leaders for Mountain Travel✦Sobek and Joseph Van Os Photo Safaris, Lisl's and Nevada's candor, humor and comprehensive instruction will improve your creative approach to travel photography, and clarify your individual role as a responsible photographer in today's complex, social environment.

Journey Inward Bound with Lisl Dennis



Travel with Lisl as she opens her creative passport to the graphic, color-intensive imagery that defines her style. Lisl's vibrant, audio visual show on Morocco preps your senses for the inner journey in destination photography. She will show her new travel video, *Adventures in Otherness*, sponsored by Canon Video. Lisl is a contributing editor to *Outdoor Photographer* and the author of how-to photo books, including her new book *The Traveler's Eye: A Guide to Still and Video Travel Photography.* Lisl's morning program includes:

- Developing personal style
- Capturing dynamite color
- Orchestrating lens optics
- Producing video postcards

Journey Out of Bounds with Nevada Wier

Follow Nevada as she travels off the beaten track, photographing far away lands, faces and customs. Nevada begins with an evocative, audio visual show on Asia that parachutes you into the realm of adventure travel photography. She shares her personal style in establishing cultural rapport and imparts technical tips to enhance your photographic experience. Illustrator of *Land of Nine Dragons: Vietnam Today*, Nevada is a Fellow of the Explorer's Club, an Outward Bound instructor and an international outdoor guide. Nevada's afternoon program includes:

- Photographing people
- Stretching your limits
- Lyrical landscapes
- Film, fill flash and filters

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OP Jan/Feb '97

Resolving Power And Sharpness

Testing Lenses • Tele-Extenders • Bugs And Low Light

BY GEORGE LEPP

How Sharp Is It?

Q *Please tell me how to test the resolving power (line pairs per millimeter) and distortion of photographic lenses.*

D. Hewette
Jefferson City, Tennessee

A We all want to know if the optics we use are sharp. Did the lens manufacturer do its job in producing a lens that's as sharp as the brochures and the salesperson promised? Have I accidentally damaged the lens by hitting it against a hard object or by dropping it? It's a question of confidence in our equipment. We want to take photographs knowing that *we* are the limiting factor in the quality of the finished results and not the equipment.

I don't feel that knowing the exact lines per millimeter is important for most photographers. Confidence in your lenses can be attained with a few simple procedures in the field. *Start by photographing under the best conditions.* This means using a good tripod that will give the camera and lens rock-steadiness. Choose a film that will establish the best possible resolution that the lens can produce. Examples for slide films would be Fujichrome Velvia, Kodak Kodachrome 25 or Ektachrome Professional E100S or E100SW.

A print film with an ISO of 100 would be the best choice for photographers who prefer color-negative film. Photograph some subjects that have lots of fine detail and reasonable contrast. These subjects should be photographed with the lens wide open and then again with the lens stopped down two *f*-stops.

Evaluate the images on a light table of the proper brightness and color temperature. Use a 4X quality loupe to look at the general quality of the images and an 8X loupe to check for sharpness in the fine details. The small details of your subject should be sharply rendered and look crisp in either a slide or negative. A 16x20-inch print with excellent detail should be possible from the slide or color negative.

When I test a lens for its highest possible field sharpness, I use Kodak's black-and-white Technical Pan film, which is the sharpest film available to me. I photograph a special test target manufactured by Charles Sleicher of Seattle, Wash., (206) 527-9170.

The lighting on the test target is from electronic flash, and I use a heavy tripod with the attached camera's mirror locked up. *Everything possible is done to make sure the results are representative of the optic* and not my photographic technique. Even with all of my precautions, the evaluation of the lines per millimeter on the negative that I obtain with a 50X microscope is subject to different interpretation by whomever is reading the results. If you're interested in these lens tests, check out my quarterly journal, *The Natural Image.* For a free sample, call (805) 528-7385, between 9 a.m. and 5 p.m., weekdays.

The true test is if you're satisfied with the images you're getting. Once you get one sharp image from a lens, you know that any less-than-crisp images later will be the result

of your lack of proper technique.

Lens distortion could be determined by photographing a square subject and looking at the image to see if the horizontal and vertical lines are parallel to the edges of the frame. If they're bowed in, the lens has barrel distortion; if they bow out, pin-cushion distortion. These types of distortion usually are associated with radical wide-angle zoom lenses. In my own experience, the amount of distortion in today's lenses is minimal and not a factor in nature photography. If you do architectural photography, however, a small amount of distortion may be a problem.

Two Tele-Extenders Revisited

Q In a recent OP article, you explained how two tele-extenders can be stacked together by placing a 12mm extension tube between them. I have a 25mm extension tube. Could I use that instead? What would I lose?

D. Farol
Via CompuServe

A The article showed how two tele-extenders that normally don't fit together could be mated with an extension tube placed between them. I recommended the use of a 12mm extension tube. The image shown here of a ladder-backed woodpecker on a blooming cardon cactus was photographed in Baja California, Mexico, with a Canon EF 300mm *f*/2.8L telephoto and both the EF 2X and EF 1.4X tele-extenders attached (840mm *f*/8), using the EF 12mm extension tube between them.

The reason for using the 12mm extension tube was to add the least amount of extension possible. With the slight amount of extra focus range beyond infinity on most telephoto lenses, the addition of only 12mm allows the lens to still focus to infinity with the two tele-extenders attached. By attaching a 25mm extension tube between the two extenders, the lens will no longer focus to infinity. We'll have exceeded the extra focus available in the lens mechanism. If the intended subjects are within the closer focus range of the combination using the 25mm tube, all is still well. Just don't expect to focus out to infinity.

Bugs And Low Light

Q I enjoy taking wildlife photos, but ticks and insects love me. Do you know of any products on the market that will repel ticks without having an odor that wildlife can smell? Also, I've taken some photos of deer in the wild between dusk and dark, and the negatives came out underexposed. I was shooting with 1000-speed print film at 1/125 sec. and the maximum aperture, f/5.6. What can I do to improve my chances with the equipment I own?

P. Rogers
Oilton, Oklahoma

A First, the bugs. Dressing right is the first step to keep the bugs from biting. With ticks, it's important to have the bottoms of your pants tightened against the leg. You can do this with a Velcro strap like bicyclists use. Spray the pant legs with a strong repellent to make the ticks stay at home. Wear long-sleeve shirts, even in warm weather.

Always check your body for ticks as soon as you come in from the field. The length of time the tick has been biting you can mean the difference in whether or not you may get Lyme disease from an infected tick (in areas where the disease is prevalent). Ticks seem to know where you can't reach or see, so have someone else check you, if possible. After being in a heavy tick area, take off your clothes in the garage and throw them in the washing machine immediately. You definitely don't want to be dealing with the critters in the house, especially days later.

Mosquitoes and biting black flies are thwarted by clothes that don't give them access to your skin, as well. Tight ankles, long sleeves, no shorts and even a head net may be necessary. I've used light gloves in Alaska to keep the mosquitoes from chewing at my hands. The best repellents are still the ones with some DEET as an ingredient. Keep this repellent away from children, as studies point to its damaging sensitive skin. DEET also tends to eat plastic cameras, so be aware of how much you have on your hands.

The more fragrant repellents will definitely tip off some mammals that are scent-sensitive. There are mask-

(Cont'd on page 103)

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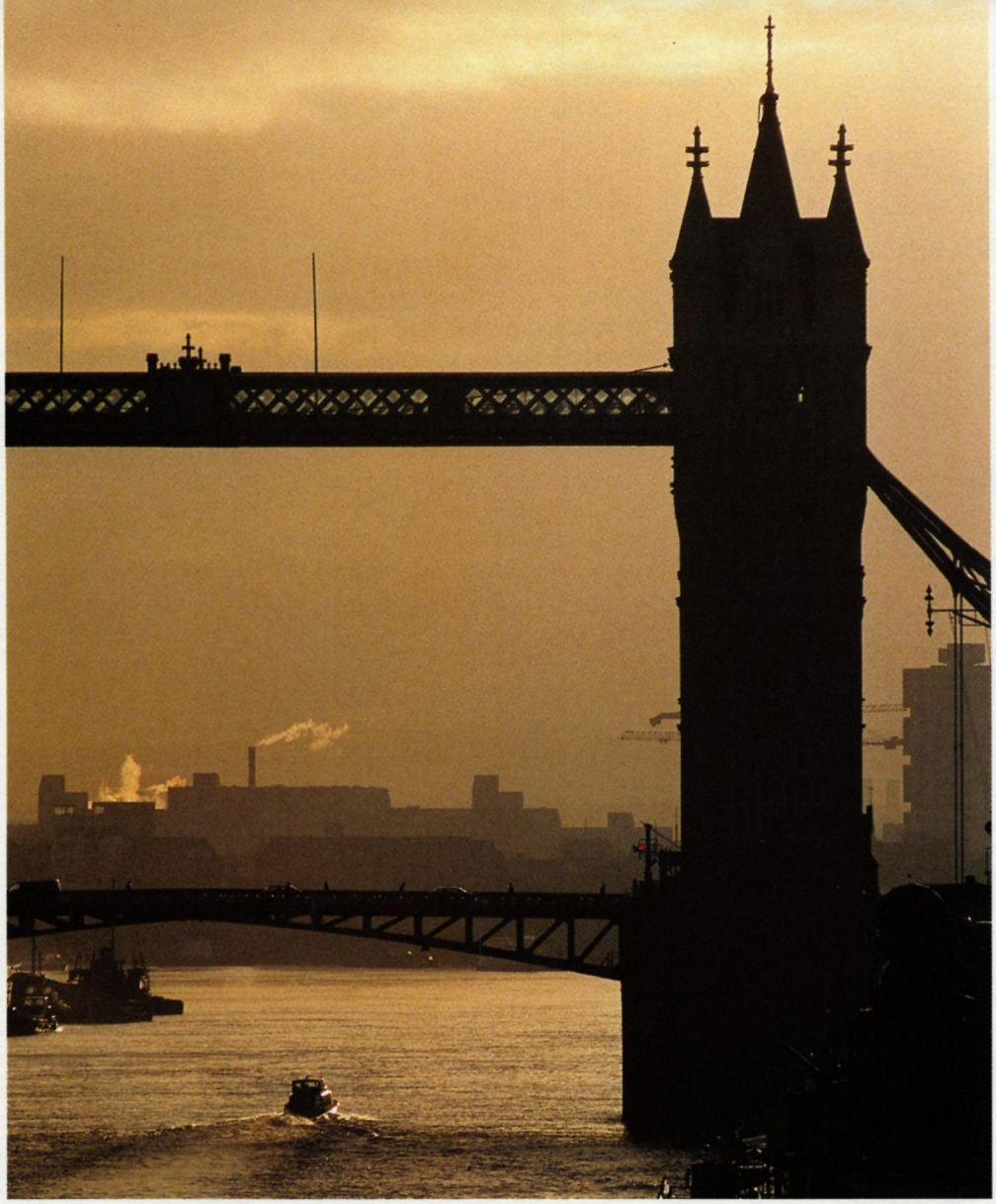
BY GALEN ROWELL

I'd never have gotten up at 4:30 on a stormy August morning in Glacier National Park if it wasn't for the photo workshop that I was leading. The forecast was for a weekend of steady rain.

As I stepped from my warm hotel room into the dark and rain, I wondered if I was really being rational. I'd given the 15 members of my group the option to meet for an official field session at 8:00 a.m. or cross Logan Pass in the dark to gamble on finding unusual light at dawn. I had brought my son, Tony, from California to join me for the three-day event with glowing stories of wildlife beneath spectacular mountains and deep blue skies. Perhaps I was trying too hard to project an image of rugged resolve.

For the better part of an hour, we drove through black rain toward Logan Pass. I rehearsed in my mind how I'd say that I had given it my best try. I had suggested to the group that the best chance of finding a clearing at dawn was on the east side of the pass, where summer storms from the west lose much of their precipitation.

When we reached the pass, a dim gray glow was barely poking through steady rain. A mile down the other side, the faint glow turned pink in the distance somewhere over St. Mary Lake. I headed for a parking area where a short trail leads to



©Peter Marlow/London 1996
Photographer Peter Marlow is a member of Magnum, an international agency of professional photographers.
Photo Data: Sigma 300mm F4 Lens. Shot at 500 at F4 ISO 50.

OUR WORLD

"Most Londoners are oblivious to the beauty of the Thames. I wanted to express the river's time-honored charm and the Sigma lens helped bring it into focus. Sigma Lenses are excellent performers. Focus is sharp. And the lens is well balanced."

Peter Marlow

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Sunrise Point atop a high bluff overlooking the lake.

The rain had almost stopped as Tony and I stepped out beneath a section of rainbow rising over the lake. When I reached the top of the bluff, I turned around and saw the heavy rain cloud through which we had just passed bearing down on us from the west. I guessed that we had less than five minutes before it would hit us; five minutes in which the sun rose over the eastern horizon with a crimson aura through the clouds. I took a few abstract shots in beautiful light, but was frustrated by the lack of a strong silhouette or foreground subject to match with it.

As the direct sun hit the oncoming wet cloud, I turned to see that a complete rainbow had dropped over the lake. On the one hand, I felt blessed to be witnessing such a spectacle. On the other hand, I knew that I was in for some of the most challenging outdoor photography of my life. I find it far easier to hang off a cliff with my camera in good weather than to stand in the rain and make sharp pictures of distant subjects.

Even if I succeeded technically, the rainbow itself was highly problematic. In the splendid warm light, it was only about half its normal width with the green, blue and violet hues of the full spectrum virtually missing. Since primary rainbows always maintain their 42-degree radius around the point opposite the sun (the shadow of your head), a photograph wide enough to show the entire thin arc wouldn't be a particularly strong image.

I sensed that the rainbow would stay around and become much stronger as the sun rose and the wet cloud passed over us, but could I capture it on film? The wind had picked up to about 40 mph and rain was beginning to blow sideways. I searched out a small overhang on the bluff that offered protection from the rain to work out of my camera bag.

From the top flap, I pulled out one of my most important items for wilderness photography: a square foot of top-quality chamois cloth. With my camera on a tripod, I managed to shoot a hasty roll of different compositions and exposures before the brunt of the rain hit me broadside, quickly soaking me to the skin, even though I wore a ski parka.

Tony had taken off to shoot from a partly protected area in the trees. I could have quit shooting, but the rainbow was now shining brighter than ever. I ducked behind the overhang, wiped my lens with the chamois and held it there until I had my next composition almost framed. Then I pulled it off for a second or two, quickly covered my lens and wiped it dry again. By repeating this procedure many times, I was able to shoot two more rolls as the rainbow gained intensity and lowered down over the peaks in direct opposition to the rising sun.

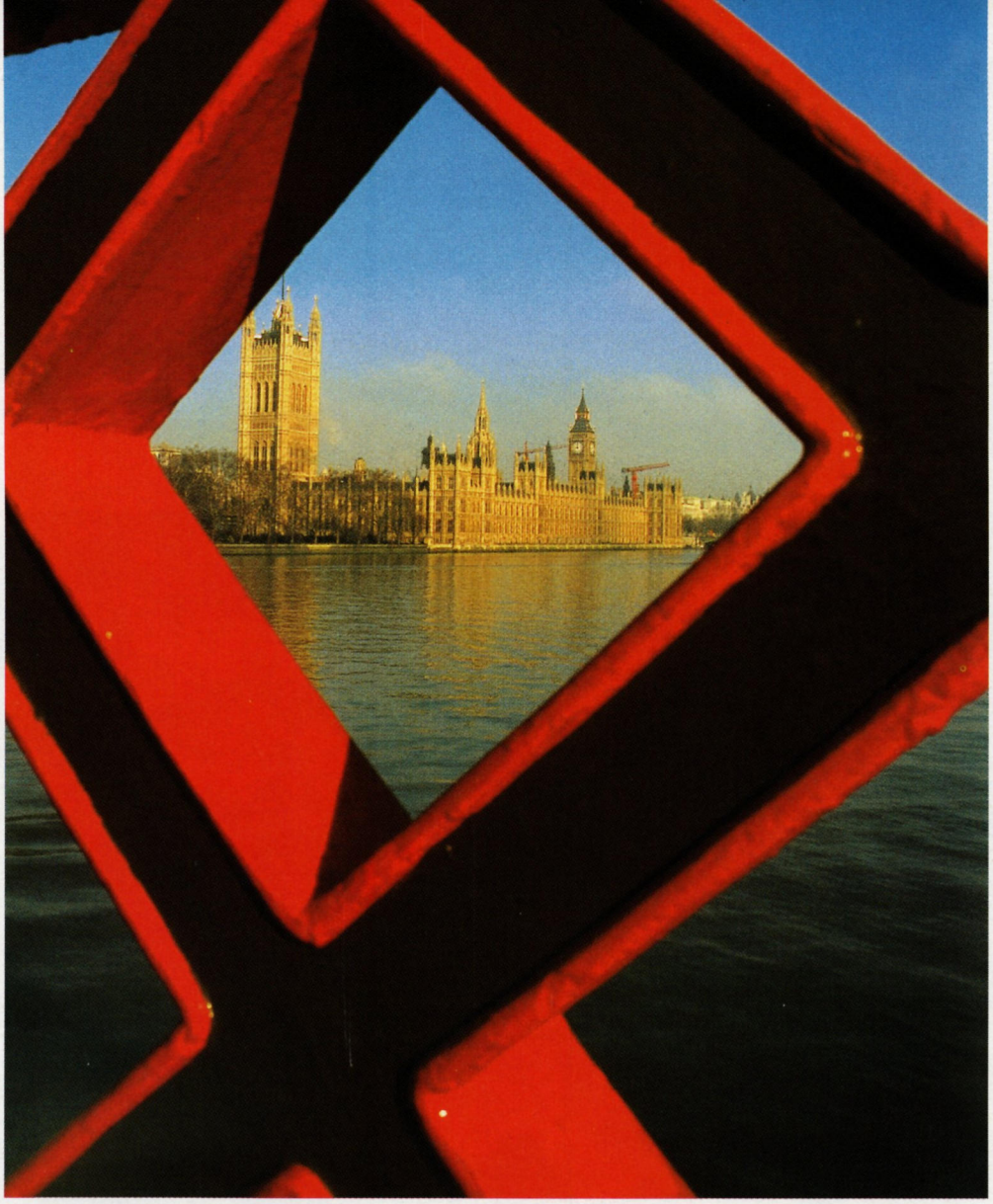
When I finally quit and returned to the car, I checked my watch and was surprised that a full hour had passed since sunrise. In the flow of the moment, working entirely in the present, it had seemed like minutes.

We dried out over breakfast in a warm coffee shop, then headed back up the pass to meet the group in far less exciting light with occasional sections of rainbows appearing now and then. As it turned out, more than half of them had crossed the pass on their own and found the dawn rainbows. After we had our film processed overnight, we had a group critique session that taught each of us an individual lesson.

Those who had braved the elements and made fine photographs of the rainbow from several different locations were rightfully proud. Those who slept in or didn't cross the pass all the way learned a lesson about the role of dedication and persistence in making the most captivating outdoor photographs.

I saw the worst weather in 10 years of Rocky Mountain workshops produce the best pictures, but I know better than to try to predict such an event. Because of what happened, I'll probably be getting up before dawn on more stormy mornings than ever, usually driving or hiking into weather that never breaks. You won't be reading about those times here, but I won't consider them as failures.

If I had to choose between actively pursuing light that never happens in a wild environment or waiting out the rain in a hotel room until the sky is clear, I'd choose the "bad" weather without hesitation. I've found over the years that the value of time spent in the wilds is cumulative, both with and without a camera. **OP**



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Photographer Peter Marlow is a member of Magnum, an international agency of professional photographers.
Photo Data: Sigma 18-35mm F3.5-4.5 Zoom Lens. Shot at 125 at F16.

OUR WORLD

"For this assignment, I went back to this familiar bridge on the Thames and made some fresh discoveries. The Sigma lens I chose is light, compact and easy to operate."

Peter Marlow

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SIGMA

What Is Essence?

On exploring "true nature" and the inner landscape

BY DEWITT JONES

I love this photograph," the photo editor beamed. "It seems you've captured the very essence of the subject." As from a distance, I heard myself proffer thanks. My head was spinning. Essence? True nature? Had I ever photographed the essence of anything? How do you come to know the *essence* of a place, a person, a still life, much less translate that knowing onto film?

The first step in finding essence, I mused, must require inner focus. Aren't I always telling my students, 'Focus yourself before you focus the camera'?

Yet, I've been cranky, cold, wet, disgruntled and out-of-it while on assignment. Still, somehow a clear vision was communicated to the celluloid. If I found the essence of a subject then, it was a miraculous accident.

Perhaps nature was focused even if I wasn't. Who then is really creating the photograph? Is it a collaboration? Or has it always been as Meister Eckhart said, "The eye with which I see God is the same eye with which God sees me."?

Well, you can see why my head was spinning.

Further examining my creative process, I realize that sometimes I start out feeling focused, only to discover that the camera itself unfocuses me. I confuse the product with the process.

I'm locked on getting the shot. At those times, the eye with which I see through the lens is the eye that has forgotten to really see. So instead of living the moment, I become obsessed with capturing it. I want to save it, to hoard it for later. Sadly, I miss being present for the experience.

Other times, I remain in focus, in alignment. At these times, I can't help but see the extraordinary in the ordinary. It leaps out at me. I don't need the camera. Life is so breathtaking and complete that it's all I can do to gratefully take it all in.

It's as if I've always known the essence of all things in my view. I've merely forgotten. And the remembrance is so

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OP41

familiar and so sweet. How I wish that I could live in this state of grace.

Increasingly, I find that it's possible to use the camera as a pathway to essence, a meditative practice to bring me into focus. I bring the viewfinder to my eye to clear out the clutter and visual noise, to find a hint of "true nature." I try to simplify the landscape to find its essence.

What am I really looking for? Perhaps it's the essence of Dewitt. Can I awaken to my own true nature? Can I remember my Self?

All of the above scenarios will no doubt continue to play out as I continue to photograph. And I'll keep noticing. That noticing, that remembering, will have to be enough. I'll use my photography as a memory enhancer. I'll ask myself when I go out to photograph, "Are you in focus?"

"What do you see?"

"Who is Seeing?" For that is the real reason I photograph—to know myself better.

Sound mystical? Okay, I'll cop to it. I never was very good at sitting on the meditation cushion. I'm not much of a joiner, and one can only stomach so many books on the spiritual search. At this point in my career, I don't much care about creating more stock images.

For me, the process of photography is a form of inward discipline or practice. It's an invitation to fall through the lens, to see my own true nature reflected back at me in the beauty and grandeur of the world—to touch essence. That simplicity and synergy where the whole of what we see is so much more than the sum of the well-focused parts. Where we know that the beauty we see is the same beauty that lives in us.

The viewer may be fooled when looking at our images, but we photographers know if we're truly in focus. We know if we're awake to essence, to our Selves, to our souls.

A quotation from Henry Miller looks down on me from my bulletin board, reminding: "The new work of art does not consist of making a living or producing an object d'art or in self-therapy, but in finding a new soul. The new era is the era of spiritual creativity...and soul making." **OP**

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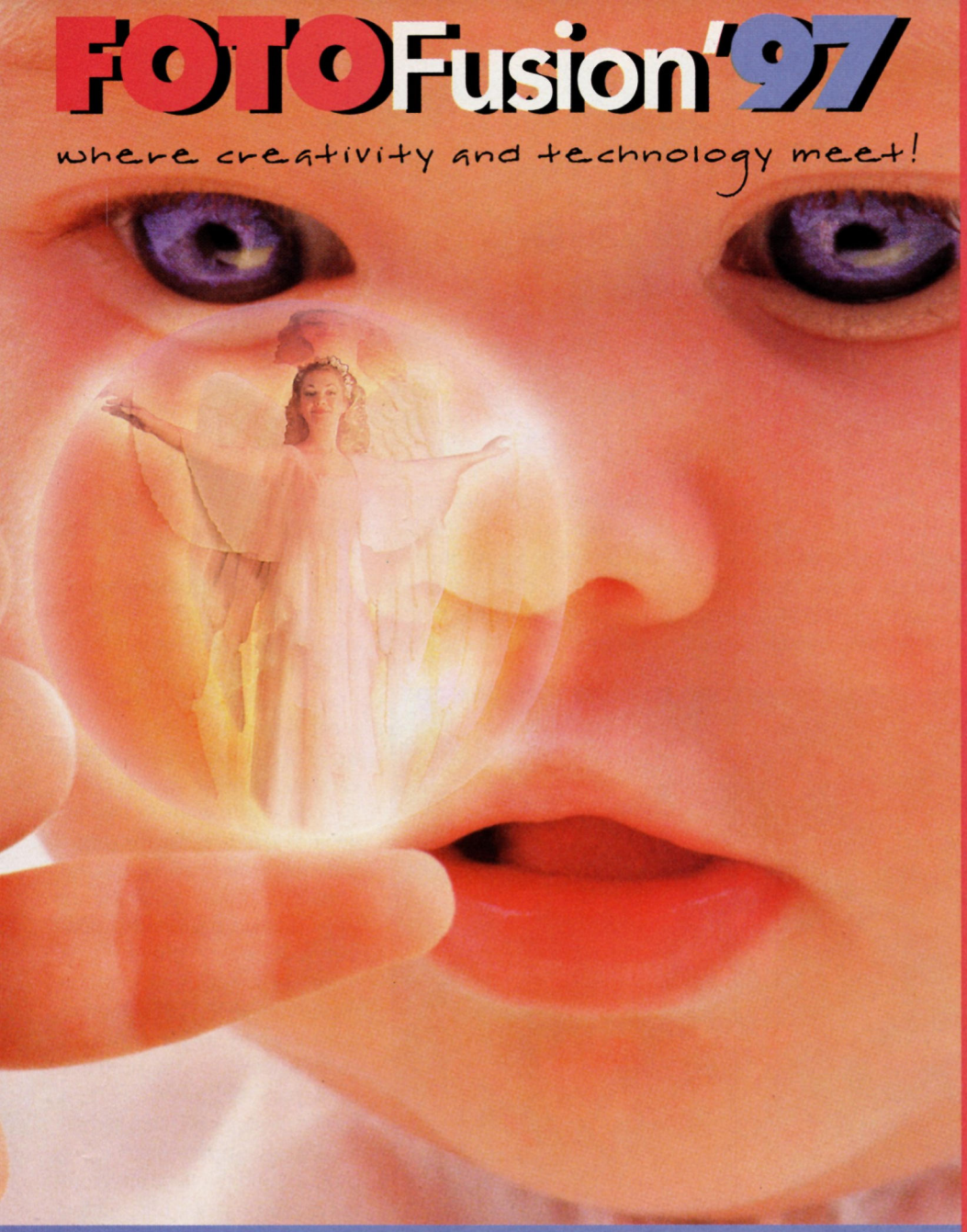

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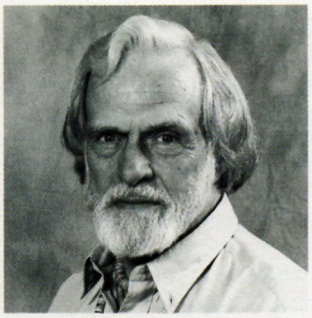


Call 'Em In

Attract predators with sounds that mimic their prey

BY LEONARD LEE RUE III

Right here in front of me, I have a small pair of plastic tubes that I got back in the early 1950s. One tube is slightly longer than the other. Inside the tubes are thin brass reeds. When blown, the small tube mimics the high-pitched death squeal of the cottontail rabbit, while the larger tube produces the lower squeal of the jackrabbit. These were the first predator calls I had ever seen. Today, there are dozens of predator mouth calls on the market; my favorites are those made by Johnny Stewart, Haydell, Circe and the Burnham Brothers.

Although predators can be called in my home area of the Northeast, wildlife in the South, Midwest and Far West respond more readily to calls. It may be that, because the Northeast is more densely populated, predators are more wary. Also, the Northeast doesn't have as many predators as the more rural and wilderness areas.

Today, more and more photographers are using electronic calls and calling cassettes. These are illegal to use for hunting because they're actual recordings of the live species, and you just can't get any better than that. But it *is* legal to use such callers for photography in most areas, although not in some national parks.

I have more than 50 calling cassettes produced by Gerald Stewart, Johnny's son, that can be used to call just about any predator species in North America. The Stewart electronic caller has a detachable speaker and, by using extra lengths of wire, I can get it out about 75 to 100 feet from where I'm hidden. This is extremely important because you don't want the predator looking at you; you want its attention to be diverted elsewhere, so you can move your camera when you have to.

Most of the calls are recorded squeals of prey species. The predators think that they can catch the prey species or that they can take the animal away from whatever did catch it. Although some predators may come galloping right in, most don't throw caution to the wind. They come in very cautiously, very stealthily.

You don't want to call on a windy day because the sound will be blown away behind you. You'll have to sit facing the wind because many predators will circle the call trying to get the scent of whatever is making the call. That's another advantage to the long speaker cord; in circling, the predator may pass behind you. You should photograph from a blind or dress completely in camouflage and have your camera covered, too. Place your blind or sit in front of a large clump of brush when possible so that you and the blind blend into the surroundings and aren't silhouetted.

Some callers sprinkle fox or coyote urine or skunk scent near the speaker to help mask human odor. It also pays to give the predator something to look at in order to focus its attention away from you. Toy fur bunnies work okay, but the greatest device is the Rigor Rabbit put out by the Carry-Lite Decoy Co., a foam-molded rabbit that moves periodically. Its action is so lifelike that all kinds of predators, including hawks and owls, have been known to carry it off.

To be successful, you have to call in areas that your quarry frequents. You can ascertain this by observation, tracks, scat

or by being told by the farmer or rancher whose land you have permission to be on. It's useless to call in areas where the quarry is heavily hunted; they become too wary to respond.

When you have everything set up and you're settled in your blind, wait at least 15 minutes for everything to return to normal. The electronic game caller has a volume control; when you start to play the cassette, play it softly for about 30 seconds so as not to scare any predator that may be close.

If you don't get a response in 10 minutes, turn up the volume a bit more and play it for another 30 seconds. Wait another 10 minutes. If there's no response, turn up the volume full blast and let 'er rip. If you still don't get a response in 10 minutes, you might as well pack up and try another site.

If you spot a predator approaching, turn the volume way down and whisper a few more calls. The predator will hear it and the sound will keep its attention focused on the hidden speaker, which is where you want it to be. The noise of your camera shutter may alarm the incoming predator or it may be so engrossed in the call that it pays no attention.

Be alert for other species, as well; I've had deer, javelinas, hawks and an armadillo come in to a call.

Another reason to be backed up against a bush or tree is so that a predator doesn't inadvertently stalk you. A number of hunters and photographers have been jumped by bobcats, coyotes and cougars in cases of mistaken identity. Don't call in areas frequented by bears and other potentially dangerous wildlife without taking the proper protective precautions.

A little less exciting, but a lot of fun, is to use the Stewart game caller, with its screech owl tape for small birds. With it, wind direction means nothing because birds can't smell. Position yourself so that the light is favorable.

I place a dead branch or sapling in front of a brushy patch. The brush gives the birds a feeling of security because the owl they hear calling can't get to them. The bare sapling gives the braver birds a place to sit, so you can get a chance to photograph them without their being hidden by foliage.

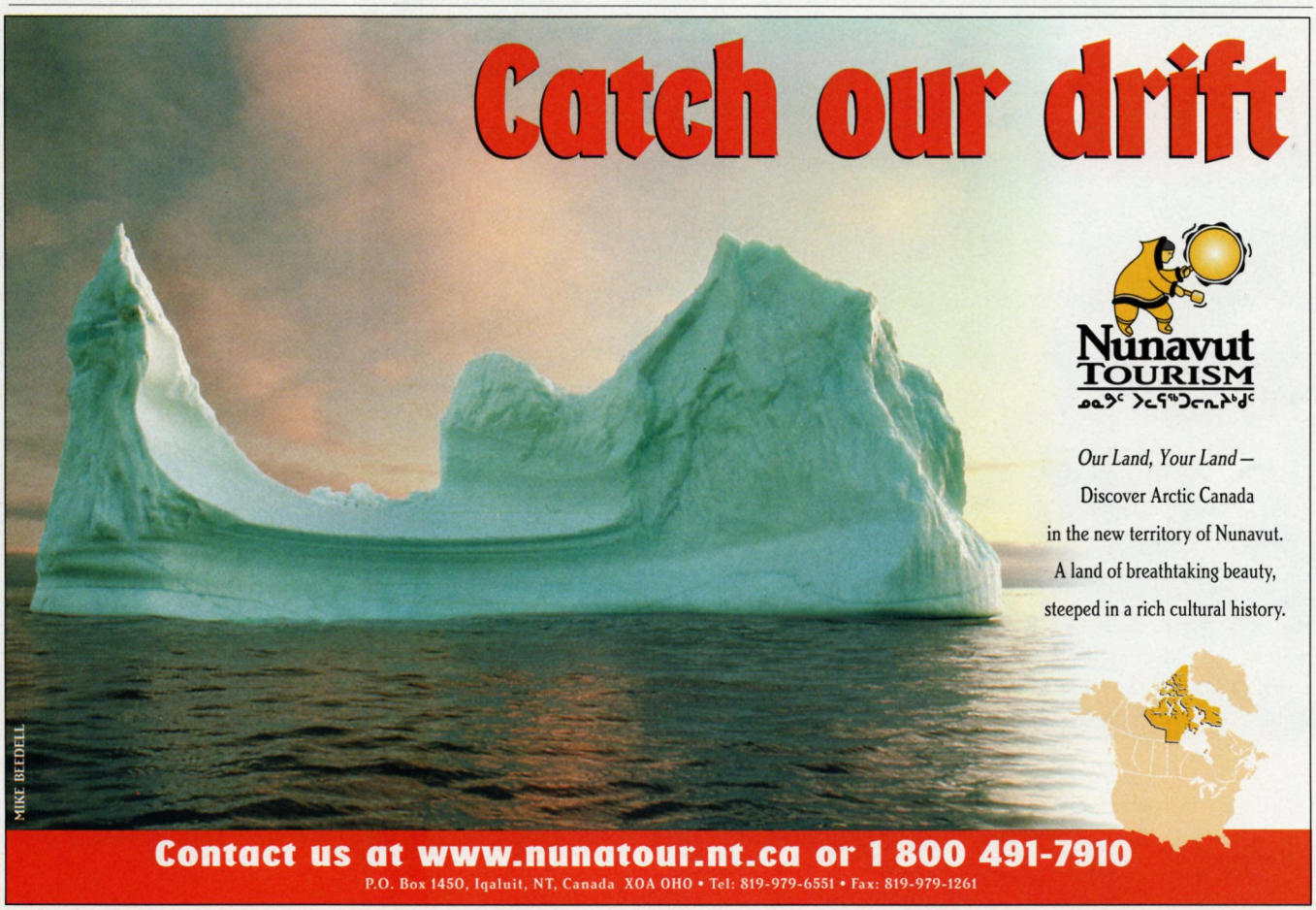
Place your blind about 15 to 20 feet from the speaker, which I place at the base of the sapling. You don't need to hide it as you would do when using it for mammals. I once had a Carolina wren land on the speaker and peer into the bell looking for the owl that it could hear, but couldn't see.

Birds will mob an owl if they hear or see one during the daylight hours, putting forth a concerted effort in an attempt to drive it from the area before dark. Cardinals, flycatchers, jays, orioles, catbirds, thrushes, finches, wrens and sparrows are just a few of the species that respond readily to calls. Some photographers also place a papier-mâché owl in the sapling, but I've never found one to be needed. The call alone works very well.

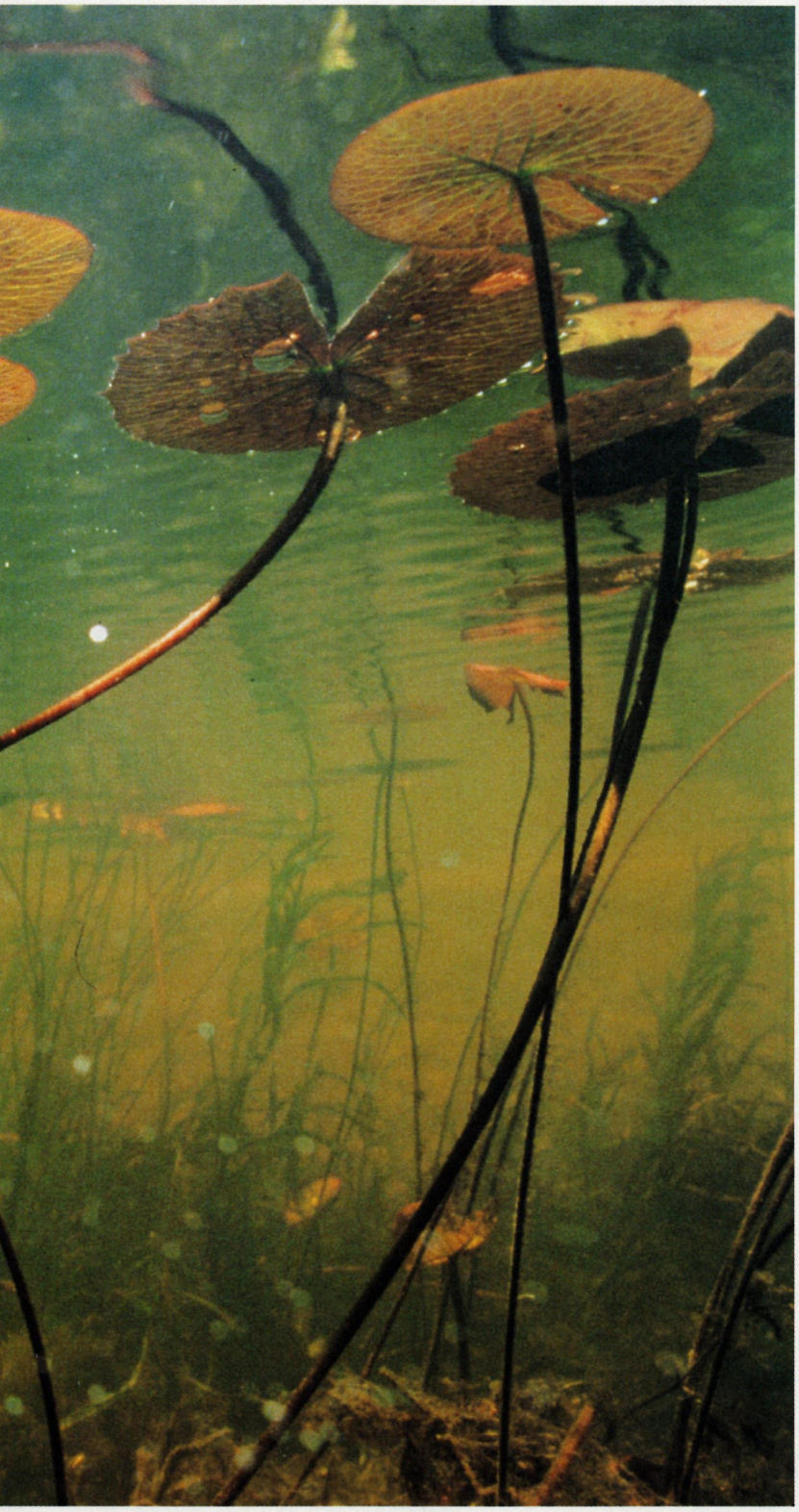
On one occasion in Texas, while photographing scissortailed flycatchers that were responding to a call, a western kingbird landed on my head. Never did get that photograph.

Some of the game callers can be purchased at your local sporting-goods store. The Rigor Rabbit and the Stewart caller and tapes are available through our catalog, (908) 362-6616.

Try calling animals in; make your own action. **OP**



Lilies Of The Desert



BY FRANS LANTING

One of the greatest challenges in photography to me is to define a personal point of view. During my work in Botswana's Okavango Delta, I looked for ways to capture the essence of this great wetland and my own response to the wonder of it. The Okavango covers thousands of square miles, but it's really just a thin sheet of water stretched across the sands of the Kalahari.

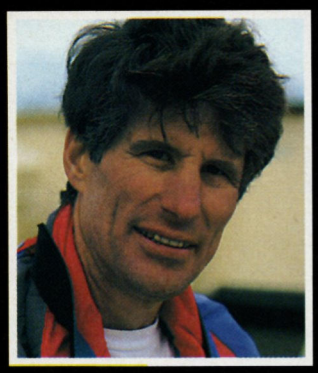
The delta's water lilies drew me in because they symbolize life made possible by water in this dry land. I photographed lilies covering lakes and giving shelter to an array of animal life, but I was searching for something more lyrical.

One day I looked down in a clear lagoon and noticed how a patch of lilies was anchored in desert sand. An idea took hold. I plunged into the swamp.

Actually, I slipped in. Quietly. Crocodiles abound here. While an assistant stood guard in a small boat, I sank to the bottom with a camera encased in a bubble-shaped under-water housing. I held my breath on each dive, which allowed for less than a minute at the bottom. It took many attempts and the better part of a day for the image to become refined. I was intrigued by the sinuous curves of the lily stems.

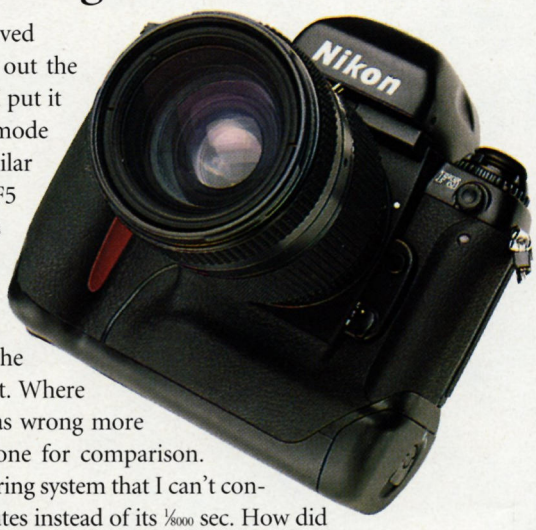
In an interesting reversal of the maxim about magic light peaking around sunrise and sunset, underwater photography conditions get better towards high noon, when light penetrates farther into the depths. By the time I had figured out solutions to the technical problems of this shot, the midday sun backlit the lily pads suspended at the water's surface.

From the bottom of the swamp, I saw that the lilies told a larger story, about the anomaly of water in the desert. In one sense, the margin for life was exactly the distance from the lilies above my head to my toes buried in the sand. But my perspective was of the exuberance, not the limits, of life. The water was only a few feet deep, but the lilies reached for the sky. **OP**



Exposure Perfect

The F5 knows what's right

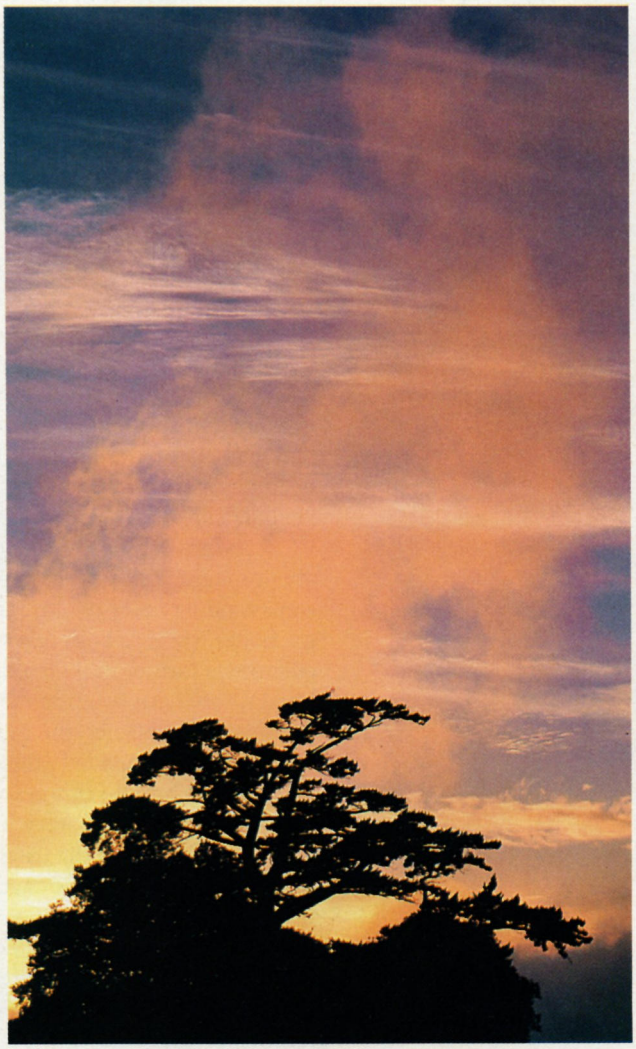


I first tried a Nikon F5 when it arrived five minutes before I was heading out the door for a workshop field session. I put it in aperture priority auto-exposure mode because its basic controls were similar to those on my trusty N90s. I shot the F5 exclusively that day and made hundreds of photographs in rapidly changing light with auto-bracketing of ±0.7 stops.

The F5 delivered a perfect exposure for every situation, with the middle one, the one the camera chose, almost always best. Where I had tried a few manual overrides, I was wrong more often than the auto exposures I had done for comparison.

For the first time ever, I've met a metering system that I can't consistently outthink, even when I take minutes instead of its 1/8000 sec. How did it know to expose for the pink fog and to silhouette this tree at sunset, yet render the same tree with fine detail at dawn, when the background ocean and fog were even brighter? The answer is in the F5's new 3D Color Matrix Metering System that processes spectral, distance and contrast information from 1005 matrix segments.

After I had a chance to try out the eight fps motordrive, the five AF sensing areas and to tailor the 24 custom settings exactly to my needs, I can't imagine using any other 35mm SLR for serious assignment work. It gives me more technical possibilities than I may ever need combined with trustworthy performance in automatic modes that allow me to make a 100-percent emotional connection with a subject in the natural world.



Metering mode switch (top left), sunset (left) and dawn (above).

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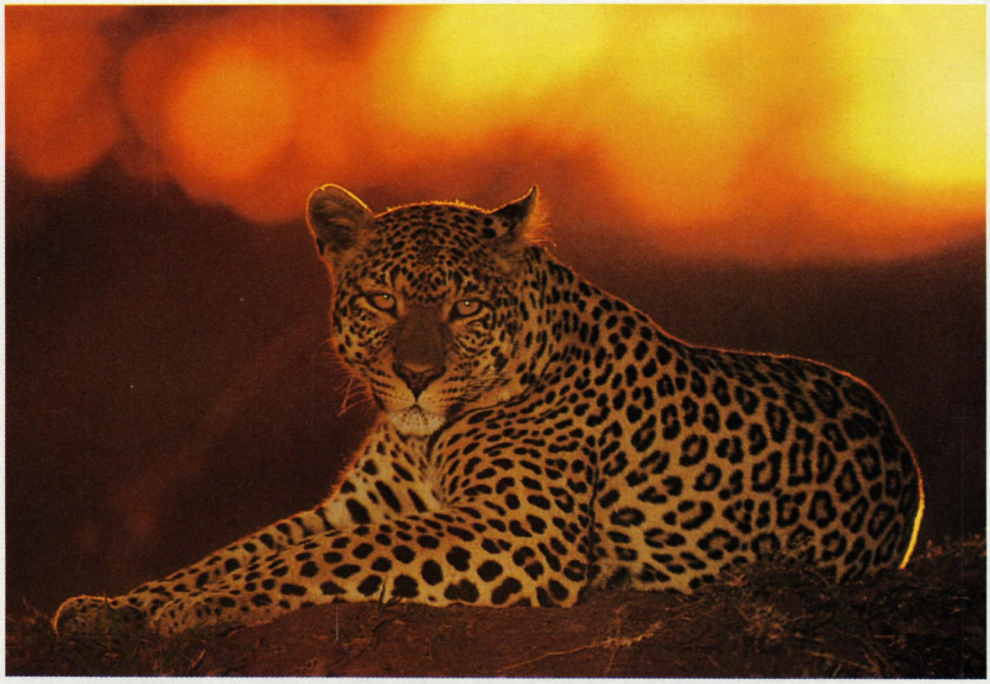
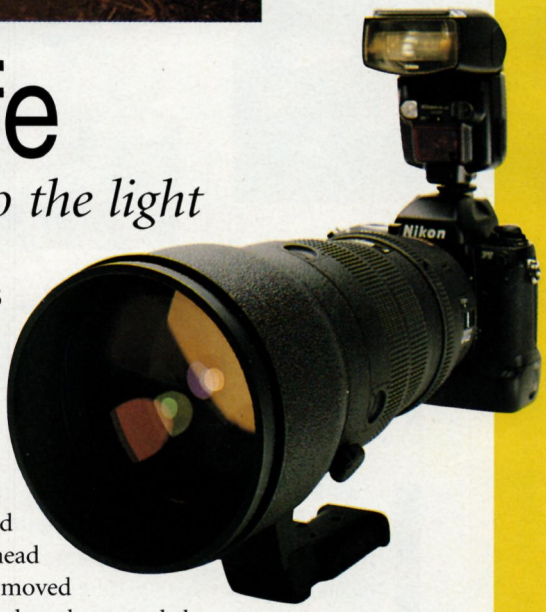


Nikon

Flash-Fill Wildlife

An F5 and SB-26 bring balance to the light



The light at sunset can be spectacular, but it often needs to be balanced to get the best photograph. With the Nikon F5 and the SB series of Speedlights, I have great flexibility in modulating the light between flash and ambient light. I can get the shot I want, with no distractions to my photography or the subject. Leopards frequently climb up above the grasses, on a rock, a termite mound, a downed tree, to gain a vantage point before they hunt. Knowing this helped me anticipate what the animal was going to do as she moved through the plain. As soon as I saw her head toward a prominent termite mound, I moved to a location that would give me a good angle toward the subject and the light with my Nikkor 600mm lens.

Five-point AF selector control

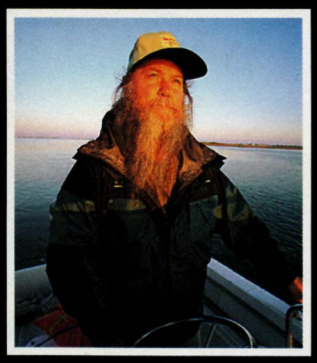
To balance the nice backlight from the low sun, I put on an SB-26 Speedlight with a custom snout that concentrated the light for the long telephoto lens. My F5 kept the technical considerations to a minimum, so I was quickly ready for the shot. Bracketing both flash and ambient light exposures was important since it's impossible to predict what balance of strobe/ambient light will look best.

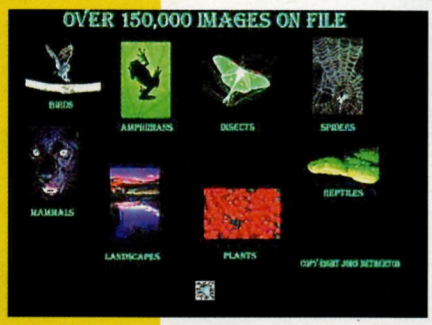
I went with a wide aperture, keeping the depth of field to an absolute minimum. I knew I couldn't move my position to change the cat's relationship to foreground and background once she found her spot. I wouldn't be able to get rid of imperfections in those areas by changing my angle to the subject.

The cat sat down on the mound and looked great. The limited depth of field blurred out foreground and background defects. The selective focus on the leopard made her stand out dramatically. I fired off a group of bracketed shots, the Nikon F5 and SB-26 quietly doing their jobs. The F5's AF system kept focus perfectly on the head, even as the big cat turned her head and looked around, changing the relative position of this key element within the frame. The off-center AF sensors made sure every frame had the head sharp.

By Frans Lanting

By John Netherton





Web-Page Adventures

Nikon Super Coolscan simplifies image capture for the Web

It wasn't that long ago that I used a typewriter to compose letters and articles. Then came the computer and much more efficient writing. That led to e-mail, writing for the Discovery Channel's Website and browsing the Internet. I began to notice a large number of photographers using the Web for their own work. This seemed to be an excellent way of getting one's photography out into the world for others to see (and, from a pro's perspective, perhaps buy).

As my vision of the new digital world expanded, the Tennessee Aquarium (in Chattanooga) happened to purchase quite a bit of my work for their displays. As we worked together, I found that they were working on a Website, and staffers Peter Burman and Bill Kinnaman offered to help me build one of my own.

Of course, one of the concerns about a Website is that photos can't be too detailed or they won't look good. The Web just doesn't have the resolution photographers are used to. Yet, if I was to have a site, I needed my photos to look absolutely as good as possible, with superior scans to digitize my slides.

That's why we worked with the Nikon Super Coolscan LS-1000. The color depth was great, with excellent resolution. That high resolution, while not visible on the Web, does bring superior tonality and color definition to the digital images. I was very pleased with the set of images that ended up on my new site.

The Super Coolscan was phenomenal. I couldn't believe how easy it was to use—push the slide in and the scan is done in less than a minute. The Nikon Scan software makes it a pleasure to adjust the image for best cropping, color, tones, etc. The unit made getting images digitized for the site the simplest, least complicated part of the process.

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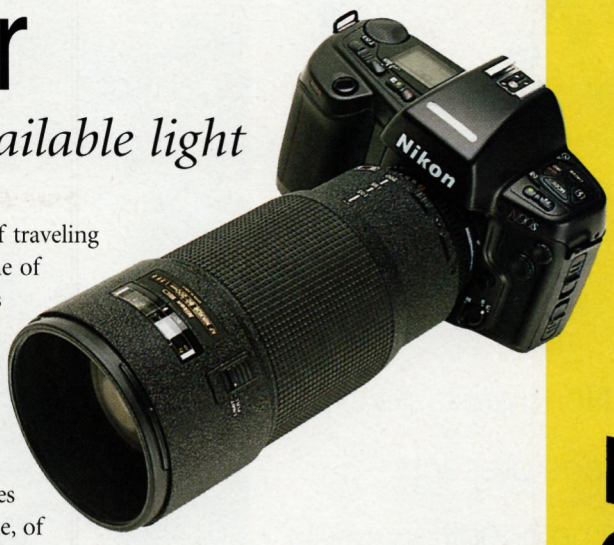
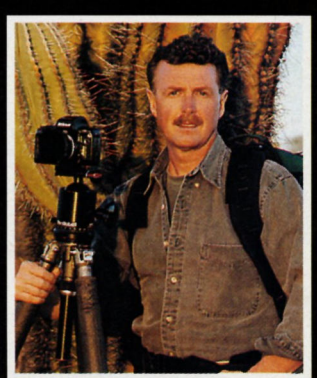


I've been using the N90s for photographing wildlife for some time now. It handles well and always meets the challenge of traveling with me. This means traveling 10 months of the year to some of the most remote, rugged and thoroughly abusive environments imaginable. My latest book, *Tribes* (Clarkson N. Potter, March 1997), presented a new challenge for me and the N90s. Never before have I photographed indigenous peoples so intensely and so intimately. In just over two years, I photographed 40 separate tribes around the world, emphasizing facial decoration and eye contact.

When photographing landscapes and wildlife, I often shoot at times of my choice, especially very early mornings when the light is, to me, of optimum quality. I rarely had this luxury while shooting for *Tribes.* I had to shoot when I could, often at the brightest and harshest times of the day. I wanted to avoid the harshness of flash—and the highlights. Using the Nikkor AF 80-200mm *f*/2.8 zoom on the N90s, I began shooting my tight portraits, whether in Africa, New Guinea or Venezuela, with my subjects in doorways. I relied on the bright midday sun reflected into the shadows to give me the look I wanted, and the camera suited the assignment perfectly. I preferred the spot meter setting and took my readings off skin tones. My exposures were always right on the money. The N90s became the workhorse of *Tribes* and never let me down. The proof is in the book!

N90s LCD mode and function panel



By Art Wolfe

Nikon

The Pro's Choice For The World's Greatest Pictures

A Challen

The Northwest Passage presents extreme conditions and fascinating compositions of seldom-seem Arctic land and seascapes

By James Lawrence
All Photographs © 1996 Robert Glenn Ketchum

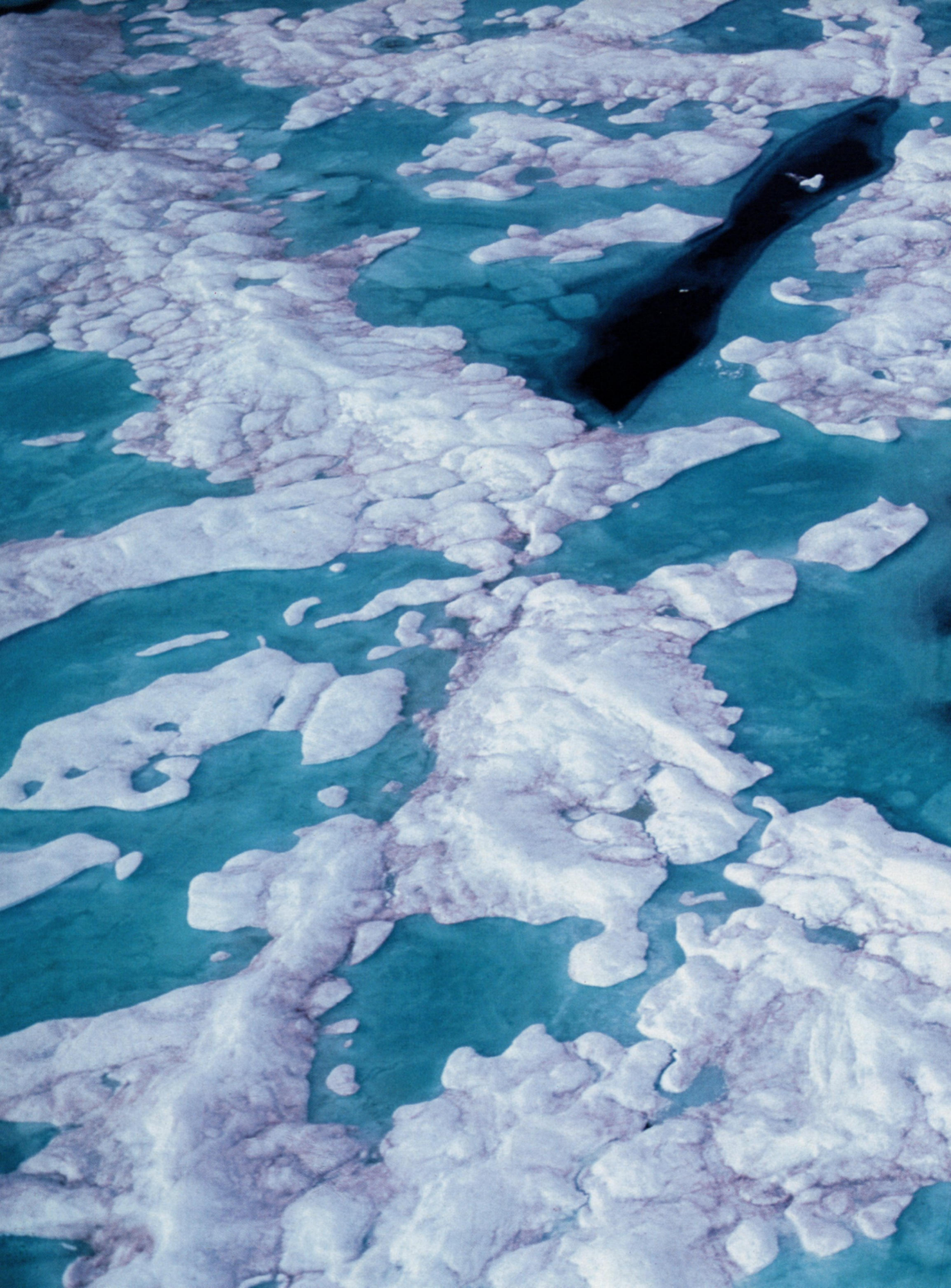
Businessman and former Secretary of the Treasury (Nixon Administration), William Simon, had a quest: to sail *Itasca,* his luxurious converted trawler, across the infamous Northwest Passage. The ship would pass through 3500 miles of iceberg-choked seaways during the favorable few weeks of the short Arctic summer.

No private vessel had ever made the crossing in one season. Even with a modern, ice-ready ship and state-of-the-art navigational technology, the venture was risky. Only 70-odd successful crossings have been made in recorded history.

Simon needed a photographer, and that's how Robert Glenn Ketchum, celebrated environmental photographer, artist and teacher, got a free, once-in-a-lifetime trip across the fabled Northwest Passage.

Ketchum wasn't about to miss

ging Land



OPENING SPREAD: ***Rebound islands like this one in the James Ross Strait literally pop up to the water's surface when the weight of massive glaciers is removed. Hand-holding a Pentax 645 in a helicopter, Ketchum captured this geographical wonder.***

LEFT: ***Pooling rainwater on the surface of a huge floeberg creates light blue splotches that contrast with the bright white of the ice and the dark blue of the ocean depths.***

All photographs: Pentax 645, Fujichrome Velvia

ABOVE: The lichen-covered shoreline of Bylot Island rises from the cold Arctic Ocean. RIGHT, TOP: The weather changes fast and often in the Northwest Passage. The cirrus clouds above a clearing weather system on Larsen Sound indicate an imminent change. RIGHT BOTTOM: Sometimes a photograph has no sense of scale. This shot was taken high above the Brodeur Peninsula of Baffin Island. The turquoise color is from melt-water as it flows over sand and silt bars.

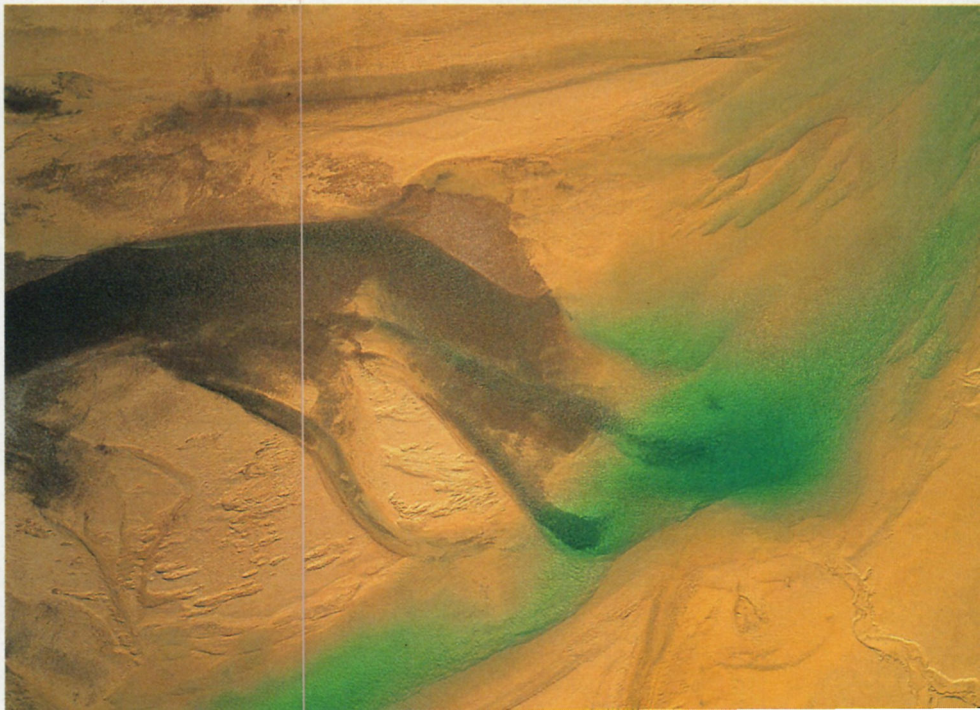
All photographs: Pentax 645, Fujichrome Velvia

this golden opportunity. Recent research had already shown him how tough it can be to spend time in the Arctic. Minimal resources and fierce competition for food, travel and lodging mean everything is scarce and exorbitantly expensive.

No, you don't pass up this kind of serendipity. Ketchum gathered up his gear and headed north to the top of Alaska.

OUTDOOR PHOTOGRAPHER: Well, Robert, congratulations on a successful trip and another fine book, **Northwest Passage,** ***from Aperture.***

Robert Glenn Ketchum: Thank you. I shot 2200 images, one of the highest production shoots I've ever had. And I didn't get to process any film on this entire trip, so I was shooting blind. Because of the dark water/white ice exposure problems, I was very apprehensive. In the helicopter flights, I was constantly shooting fast-changing vistas with no chance to bracket: one minute there's a brilliant glare on the water; five



seconds later it's a totally black ocean; then right back into the glare. I'd be changing four and five *f*-stops in manual mode.

OP: Was it medium-format equipment all the way?

Ketchum: I took my Pentax 6x7 and 645. I figured I'd use the 6x7 on a tripod and the 645 for the hand-held work. The truth is, underway at 12 knots, there are all kinds of subsonic vibrations through the hull. That meant no chance of working off the deck with a tripod. That's

why almost everything you see in the book was taken hand-held with the Pentax 645.

OP: Is the 645 your normal workhorse?

Ketchum: No. At first, I wondered, 'Why a small medium-format camera?' Then I shot with it and thought it really handled well. It gave me an exceptional number of good exposures, which I attribute to its extraordinary meter. I was working in manual mode, bracketing when I could. And I have to say almost all of those open-ended exposures were right on the money, while my brackets were often the shots that were off! It's one of the more spectacular cameras on the market.

OP: What general recommendations do you make for shooting in these conditions?

Ketchum: Take plenty of film and bracket to cover your exposures. In the Arctic, the water is so clear and pure it reads almost midnight blue, as dark a blue as I've ever seen. Late evenings and early mornings, it looked black, oily. Throw a lot of white ice on top of it, and you don't even need sunlight to make that a contrast problem.

OP: You've championed Fujichrome Velvia for years. Did you use it on the project?

Ketchum: Yes. I shot one roll of Provia, the rest was Velvia. You can put a large print made from the 645 transparencies up against any print from a 6x7, and I defy you to see a difference. That speaks to the quality of the film base. Only in the clearest sky shots can you even see a hint of a grain pattern.

OP: A lot of photographers find that snow and sky present some difficult challenges to render well. Did you?

Ketchum: The advantage I had in this world of white was that, with all its reflectivity, depth of field wasn't a problem. I had plenty of it even when I was shooting hand-held. It was so bright, I was probably stopped all the way down and often still shot at 1/125 or 1/250 sec.

You do have to be careful about exposure when shooting in the white because it's fooling the meter into stopping the lens down more, which can give you a darker image than you want.

OP: What was it like shooting so much from the ship?

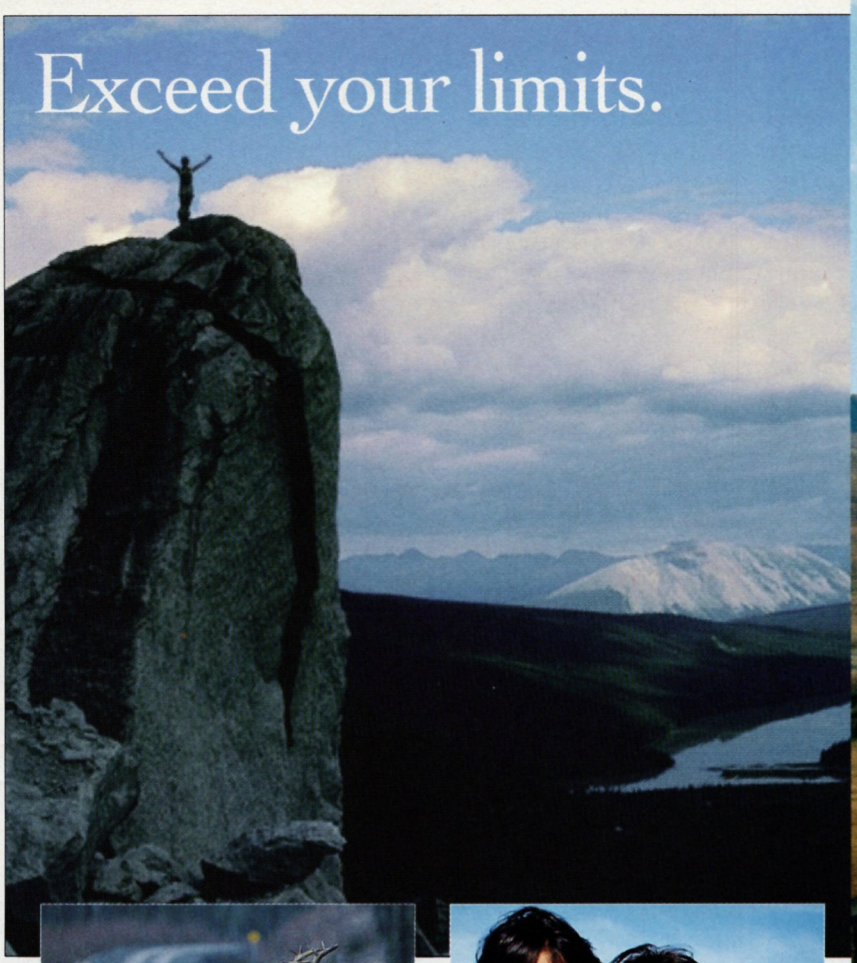
Ketchum: There were photographic problems inherent in that. Everything was always at a distance from you. You're never exactly intimate with anything. So it was really important for me to get out the appropriate lenses *and try to work as if I was standing on the ice,* not shooting from the boat.

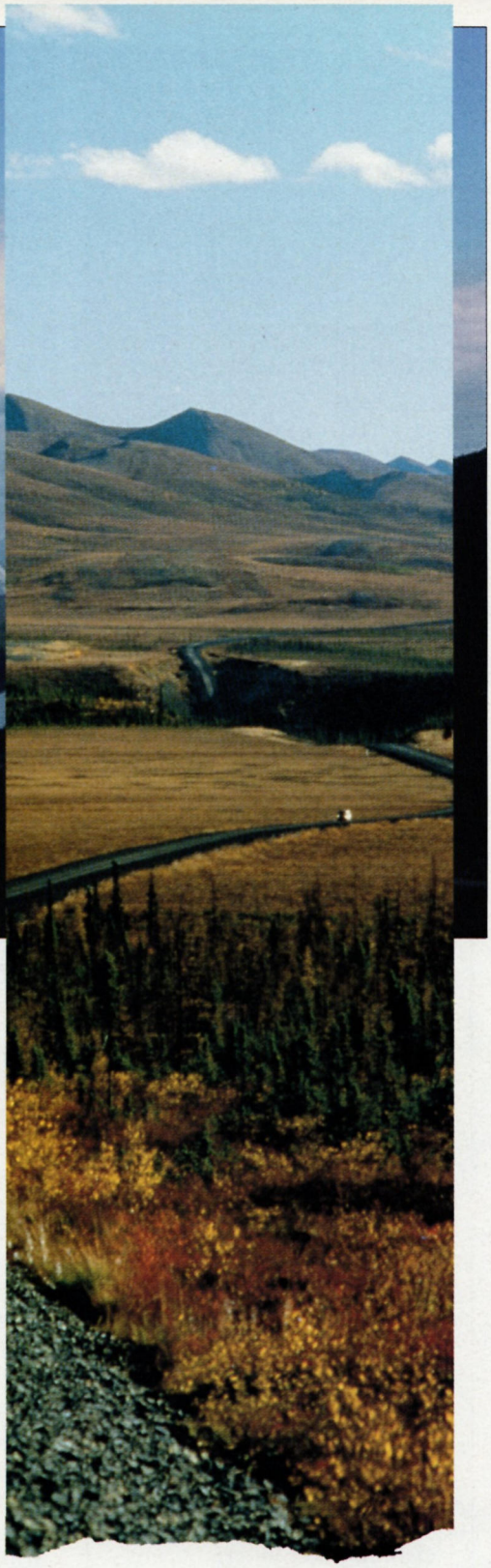
Most of the time, I was leaning out over the lower rails, shooting into the ice pack. The boat's lowest decks gave us an almost ground-level viewpoint.

OP: What was it like to shoot up there? You hear of the midnight sun that never sets in summer, of freezing blizzards and so on. What was your physical experience?

Baffin Island's coastal mountains meet Lancaster Sound at the edge of the Brodeur Peninsula. This image captures a dramatic transition from land to sea where rugged mountains descend right into the water.

Exceed your limits.





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CHALLENGING

Ketchum: The amazing thing is that the lighting is constantly changing. It can go from overcast and arctic fog to brilliantly illuminated skies, then back to fog in two or three hours. I've never seen a place that changed so rapidly. And there were lots of blue skies.

OP: Really?

Ketchum: Absolutely. The temperature got up in the 60s during the day. There were only a couple of evenings where the sky was overcast. The rest of the time, it was at least 50 percent or more open blue sky.

OP: So you didn't have to lug a lot of cold-weather gear with you?

Ketchum: No. Bill Simon had carefully studied weather records going back six years. He picked the slot perfectly for the best weather. For two months of the year, it's very benign.

I will say the wind is cold and fairly constant. With the windchill on any given day, you can get down to freezing, so you want lots of shell layers, with each layer a buffer from long-term exposure.

OP: In* Northwest Passage, *you mention an abundance of wildlife, yet there are no animals in the book.

Ketchum: I have to leave that to Jim Brandenburg and Art Wolfe and the like. I have so much respect for those photographers. You need a special kind of patience. I don't feel that's my strong point. I've always been an observer of the land, the look of the land.

OP: In your book, I was struck by a wonderful quote from Barry Lopez about 19th century painters of the North American landscape shedding their egos and letting the authority of their work lie with the land itself. It seemed to me to be a perfect description of your Arctic photography.

Ketchum: It's pretty much what I do. I utilize more depth of field, with tripod, so I engage the landscape at a slightly different level. I work to discover the magnificent in the ordinary. I'm not famous for my big vistas, panoramas or overlooks. Most of my pictures are totally anonymous bushes, rocks and trees. I try to allow those more common aspects of the landscape to speak to me.

My biggest problem was so much water and ice and sky day after day. I made a lot of big sky and iceberg shots, but I was surprised at the variety.

The sky is everything up there. It's one continuous sky show. Storms have meaning, especially to the Inuit natives. Sky causes mirages. Sky is an important focus of Arctic research. So it was completely appropriate in my photographs.

It's not the same scale as you experience here. You sense your fragility and your smallness much more. There are no cities on the horizon to measure distance by.

OP: Except the mirages.

Ketchum: Arctic mirages are sophisticated. Once we saw the entire sky-line of Prudhoe Bay hanging upside down from a cloud that didn't exist. As the mirage got clearer, we could see trucks driving around. "My God," somebody said, "that's Prudhoe Bay!"—which by then was 350 miles to the west, well below the curve of the horizon. Barry Lopez wrote in *Arctic Dreams* of seeing 12 suns at the same moment.

QUICK TIP

Aerial Shooting

If you can find a decent window, especially in smaller planes where you can open it, you're in a place with an amazing view. Clean the windows, but don't worry about small flaws in the plastic or glass. They'll be out of focus at infinity. Shoot as fast as the light will allow, and isolate your upper body as best you can from the vibrations of the aircraft.

OP: What was your biggest challenge photographically on the trip?

Ketchum: Motion and vibration on board and especially in the helicopter. I shot at the highest speeds I could, between 1/250 and 1/500 sec. Everything is pretty much at infinity when you're in the air, so you can open up your aperture without worrying about depth of field.

I'd use a slight telephoto, 80mm to 105mm in 35mm-equivalent terms, because it got me out beyond the wing or the rotorblade.

OP: What rewards did you gain from this experience?

Ketchum: I saw more of the Arc-

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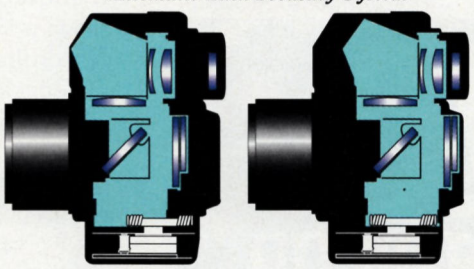

Base position of the inner chassis

Maximum rear position of the inner chassis

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The Contax AX allows maximum flexibility in focusing. There are two auto focus modes: Single AF confirms that the subject is locked in focus before making the exposure. Continuous AF updates the focus constantly as the photographer tracks the subject and predicts where the moving subject will be at the time of exposure. This new system lets the photographer switch between auto focus and manual focus easily.

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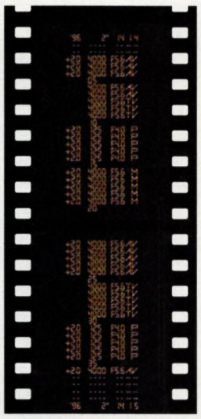
The optional D-8 Data Back was designed exclusively for the Contax AX. It will print exposure, date or sequential number information between the frames of your film without the intrusion of printed information on the photograph itself. However, it also has an option that no other data back can offer. Rather than printing technical data between frames, the camera advances past the first two frames. Then as you take pictures, the D-8 will store information on each individual image. As the film is rewound, exposure information is downloaded directly onto the first and second frames. This provides instant access to all technical data used to create each picture.



Simulated information downloaded from D-8 Data Back

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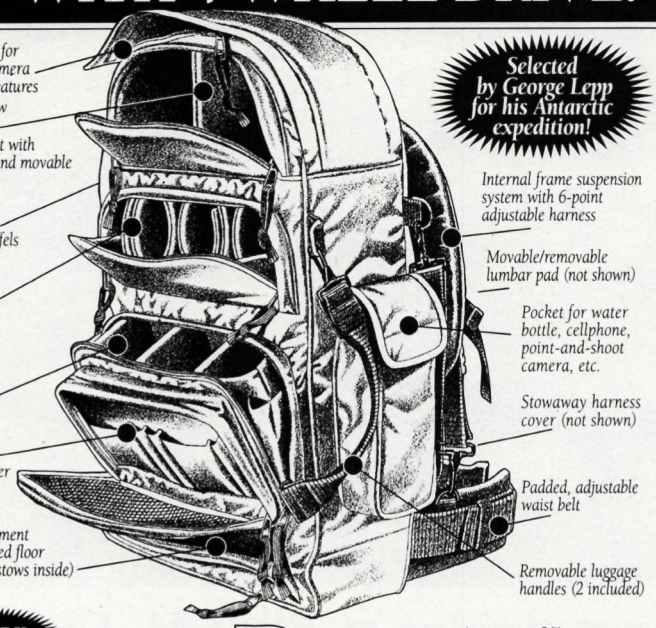

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CHALLENGING

tic in one panoramic sweep than probably anyone else ever had. The international perception of the South Pole and Antarctic region is of a place where all the powers of the world came together to sign a treaty to protect it from exploitation.

But Antarctica is a sterile continent completely covered by an ice cap. Very few things actually live there. The Arctic, on the other hand, is one of the richest pelagic breeding areas in all of the oceans. Pelagic means those species that migrate to breed. As much as 80 percent of the pelagic species of the world breed in the Arctic in the summer. Imagine the vulnerability of hundreds of thousands of species of fish and birds to a bad oil spill or disruptive industrial exploitation.

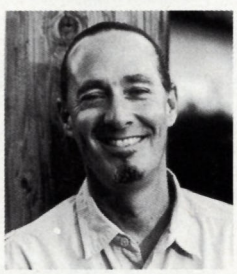
Yet we seem to be willing to allow whatever will happen in the Arctic to just happen and fight instead for Antarctica. This is a great oversight, to sacrifice one place for the other.

The Arctic is at environmental risk. It's been exploited mightily by most of the major nations that make up the circumference of the North Pole. Canada is very casual about its deep-water drilling for oil. Russia has used it as a nuclear waste dump.

We'd be wise to consider that, for the first time in world history, the world food reserves dipped last year. And our population is still growing. I think we've begun our decline, so saving whatever resources we have is an absolute priority. Every last fish caught would have some kind of value.

OP: I read recently that millions of salmon were ground up and dumped at sea because of the over-abundant harvest up north.

Ketchum: What kind of system destroys living things because there's no market for them? We have to wake up. We have to wake up now. **OP**



Robert Glenn Ketchum

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Banff National Park with David Muench, Bill Fortney, Cliff Zenor, June 18-22
Olympic National Park with Art Wolfe, Bill Fortney, Cliff Zenor, June 25-29
Grandfather Mountain with Bryan Peterson, Bill Fortney, Cliff Zenor, October 24-28

Extended Weekends:
Yosemite National Park with John Shaw, Bill Fortney, Cliff Zenor, March 9-13
Arches National Park with Pat O'Hara, Bill Fortney, Cliff Zenor, September 26-30
Acadia National Park with Rod Planck, Bill Fortney, Cliff Zenor, October 17-21

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Smokies Advanced with Bill Fortney, Cliff Zenor, April 25-29
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Rockies Wildflowers David Middleton, Bill Fortney, Cliff Zenor, July 16-20
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Smokies Wildlife Tour with Bill Fortney, Cliff Zenor, November 12-16

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Drive To The Arctic

The Dalton Highway gives you a chance to see and photograph some of Alaska's most remote terrain

Text And Photography By Paul Souders

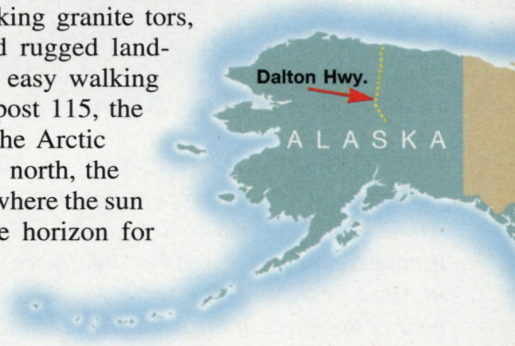
You can forget about $300-an-hour charter flights into Alaska's Arctic for a little while. The Dalton Highway has recently opened up an affordable travel frontier for wilderness photographers. The State of Alaska has removed the last legal obstacles to public driving on the Dalton Highway, known throughout Alaska as the "Pipeline Haul Road." The highway now offers access into the heart of the Brooks Range and the arctic North Slope, where migrating caribou, wolves and bear roam the virgin forest, open tundra and rugged mountain landscapes.

This 414-mile gravel road originally served as the construction road paralleling the Trans-Alaska oil pipeline from north of Fairbanks to Deadhorse and Prudhoe Bay on the Arctic Ocean. Until December, 1994, the official policy was that a permit was required for travel on the road, though it was largely unenforced for years. It became the poor man's route into the Arctic. With the opening, you could conceivably drive from Key West, Fla., all the way to the Arctic Ocean.

The Dalton Highway offers a unique opportunity to admire the Arctic landscape and wildlife. North from Livengood, the road wanders through nearly 100 miles of spruce forest. Vistas from ridgetops span more than 50 miles of virgin forest. Traveling at dawn or dusk offers the best light, as well as improved chances of spotting black bears and grizzly bears along the roadside.

The highway crosses the Yukon River 55 miles north of Livengood. Alaska's longest river stands nearly a half-mile wide at this point on its way to the Bering Sea. Fine views are available from the wood-decked bridge, and tour boats are available to take visitors to an Athabascan Native fish camp on the river's shore in summer.

As the road climbs above treeline for the first time, striking granite tors, rolling tundra and rugged landscapes are within easy walking distance. At Milepost 115, the highway crosses the Arctic Circle. At 66° 33' north, the circle is the point where the sun remains above the horizon for 24 hours on the night of summer solstice. North of here, the sun stays up for longer periods. In Deadhorse and Prudhoe Bay, the endless summer day lasts from May 21 until late July. Genuine nighttime darkness doesn't fall until sometime early in September.



The Bureau of Land Management (BLM) main-

OPENING SPREAD, TOP: Northern Alaska's ever-changing weather in the foothills of the Brooks Range and Arctic Coastal Plain at the western edge of Arctic National Wildlife Refuge. BOTTOM: The autumn colors of arctic tundra can be just as vivid as their more temperate floral cousins, as captured in Alaska's Gates of the Arctic National Park. THIS PAGE, TOP: A grizzly bear in the north of the Arctic Circle in the Brooks Range, north of Atigun Pass. ABOVE: Seen from above, the roughly parallel courses of the Alaska Pipeline and the Dalton Highway through the Alaskan wild make areas like this, near the Arctic Circle, accessible.

BROOKS RANGE: Fuji G617, 105mm *f*/8 Fujinon, Fujichrome Velvia; TUNDRA: Canon EOS-1N, Canon 50mm *f*/2.5 Macro, Fujichrome Velvia; BEAR: Nikon F4s, Nikkor 600mm *f*/4 ED-IF, Fujichrome Velvia; PIPELINE: Nikon F4s, Nikkor 300mm *f*/4, Fujichrome Velvia

tains an interpretive sign at the Circle, along with picnic tables, outhouses and a primitive campground. Many tourists turn around after souvenir snapshots here and head for home, but they miss nearly all of the most exciting sights the Dalton offers.

Within another 50 miles, the Brooks Range begins to loom along the northern horizon. Alpine lakes line the road, reflecting the gentle tundra and distant mountain spires. At Milepost 175, Coldfoot offers the last gas, food, hotel and garage for 240 miles.

Along the way, check out the BLM's cabin, where volunteer rangers happily provide background information. There's also a list of recent wildlife sightings along the highway's length; "Mux ox at Franklin Bluffs" and "Bears near Atigun" were among the many entries last summer.

The Brooks Range commences in earnest soon, with 4000-foot Sukakpak Mountain marking the traditional boundary between Eskimo and Athabascan Native lands. Though there aren't any real trails, it's easy to hike into the high country. Gorgeous views greet anyone who wanders above treeline.

Spectacular mountain vistas line the highway all the way north to Atigun Pass at Milepost 245. I always marvel at the jagged spires around Wiehl and Poss Mountains, which rise

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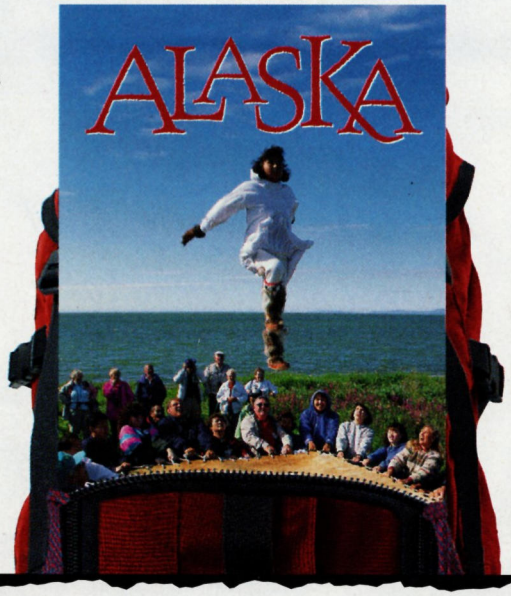

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steep and jagged above the Koyukuk River Valley.

The Dalton Highway offers the only road access to the Brooks Range mountains, crossing Atigun Pass where the steeply winding road is surrounded by towering 7000-foot spires. The Brooks Range is the only mountain range in the world located entirely above the Arctic Circle. The road climbs most steeply here and, at 4800 feet, this is the highest road pass in Alaska.

North of the pass, the Atigun River has carved a narrow, beautiful valley of tundra and glacial gravel. This valley and its surrounding peaks remain one of my favorite spots in all of Alaska. Dall sheep congregate along the mountains' steep cliffs, where I've seen as many as 30 sheep feeding on tundra or at mineral licks.

Dropping from the pass, the road runs along the Atigun River in a broad, mountain-lined shelf. Caribou from the Porcupine herd, wolves, arctic fox and the occasional wolverine populate this valley and approach to within easy photographic distance from the road. As many as a dozen grizzly bears call this valley home, so be aware if you're hiking in the backcountry.

The Atigun River passes under the highway around Milepost 270. The river valley narrows and forms an impressive canyon about three miles east of the road near the western boundary of the Arctic National Wildlife Refuge. It's rugged hiking on the north and south sides of the river, but it's well worth the tramping through soggy tussocks to get away from the pipeline and road and back into genuine wilderness. Spectacular cliff faces catch the northern sun's last orange glow and seem more reminiscent of the American Southwest than the Arctic.

At a nearby landing strip, there's a rough camp in a gravel pit and some gorgeous hiking trails that lead into the Gates of the Arctic National Park, only three miles to the west. The Itikmalak River Valley lies through one low pass, and 7000-foot spires line the narrow valley. This is some of Alaska's most accessible, yet solitary wilderness. With a topographical map and backcountry camping gear, you can spend weeks exploring this and neighboring river valleys and not cross paths with another soul.

Travelers should be aware that hunters use the road for the same kinds of backcountry access in pursuit of migrating caribou and Dall sheep throughout the late summer and fall, so a modicum of care and courtesy are called for.

Brooks Range weather is, in a word, unpredictable. My first trip to the mountains, in mid-August, left me tent-bound in a snow and ice storm one afternoon. I sweated happily in shorts and T-shirt the next day and marched through sleet and slush the day after. Like a good scout, be prepared. It can snow 12 months of the year in these mountains, and often does.

While August may be the height of summer in the lower 48, it's definitely fall in the Arctic, heading fast toward the long winter freeze. Bring warm clothes and suitable raingear. You may not need a heavy parka until September, but be ready for temperatures below freezing.

Winter winds down late in the North, but summer arrives with a flourish. The sun that rises on May 21 on the North Slope won't set until late July.

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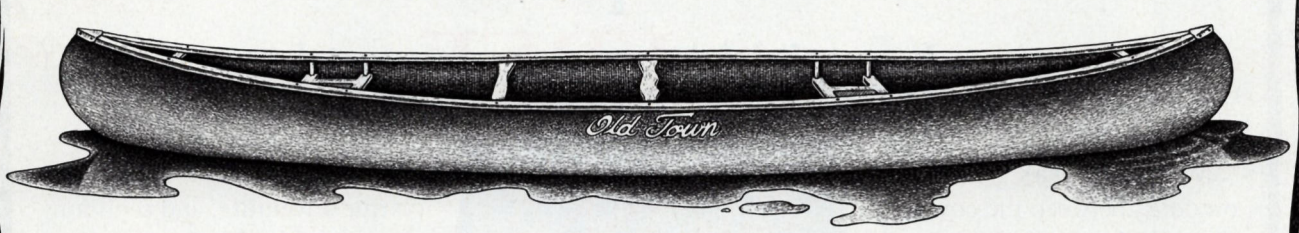

The bull moose raises his dripping head not so much out of curiosity as respect.

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It's under this endless sun that another Alaskan legend breeds—the vicious arctic mosquito. Summer is a short, bittersweet affair, but the lowly mosquito seems determined to make the most of it.

Clouds, swarms, veritable armies of mosquitoes fill the air and surround anyone who ventures out. Avon's Skin-So-Soft is rumored to help, though a good slathering of 100-percent DEET works its carcinogenic magic by keeping the little beasts from biting (while melting plastic camera parts in the process). A head net remains the only way I've found for keeping them out of eyes, nose and mouth. I consider the bugs the Arctic's price of admission. At least they keep the riffraff out.

Heading north past Toolik Lake and Slope Mountain, the land opens into a broad coastal plain. The Brooks Range is left behind and the North Slope descends gradually toward the Arctic Ocean. The road grows noticeably rougher here. Last summer's trip left me with two flat tires in less than 40 miles. Snowy owls, fox, wolves and the occasional bear roam the open tundra.

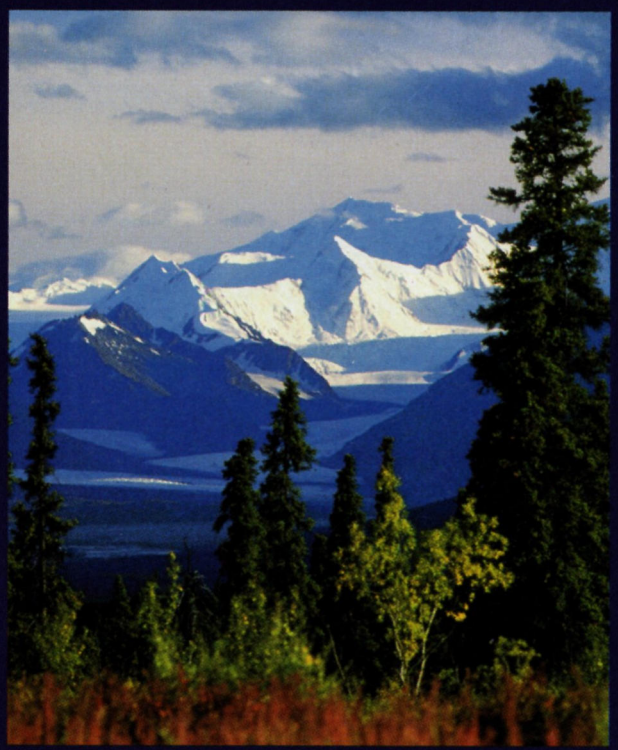
A musk ox herd frequently makes its home just across the Sagavanirktok River, about 60 miles north of the pass. The river runs deep, fast and cold here, and there's no safe way to ford it. I've watched the herd slowly grazing on the rolling tundra, the arctic winds blowing their long brown coats, creating a truly primordial scene.

Arctic wolves also hunt here. One night last summer, I saw nearly a dozen jaegers lined up on the road, peering anxiously out at the tundra. Backlit by the setting sun, a lone wolf ambled along, stopping to rob the nests of their eggs.

In mid-summer, the sun never sets, and it's possible to set up for the classic multiple-exposure image of the midnight sun. Around Toolik Lake, the sun actually passes due north at about 1:45 a.m. By mid-August, nighttime frosts turn the tundra into a blazing carpet of red and yellow. Heavy snows and below-freezing temperatures generally begin soon after the Labor Day weekend. Winter's grip tightens on the land, with six months of darkness and temperatures plummeting past 50 below.

On the northern horizon, Deadhorse slowly rises from the tundra in a maze of pipelines, ugly portable trailers and abandoned drilling gear. Alyeska Pipeline owns the lease to the roads that lead to the Arctic Ocean, and security guards block access to all private vehicles. Several tour operators offer four-hour bus tours out to the coast, which is ice-bound well into July. Caribou frequently wander among the pipelines and will stand on the elevated roads in the hope of finding a breeze to disperse the maddening clouds of mosquitoes. From Deadhorse and Prudhoe Bay, there's nowhere to go but south. Hang a U-turn, and it's only 490 miles back to Fairbanks. **OP**

***Paul Souders** is a free-lance travel and wilderness photographer based in Seattle, Wash.*



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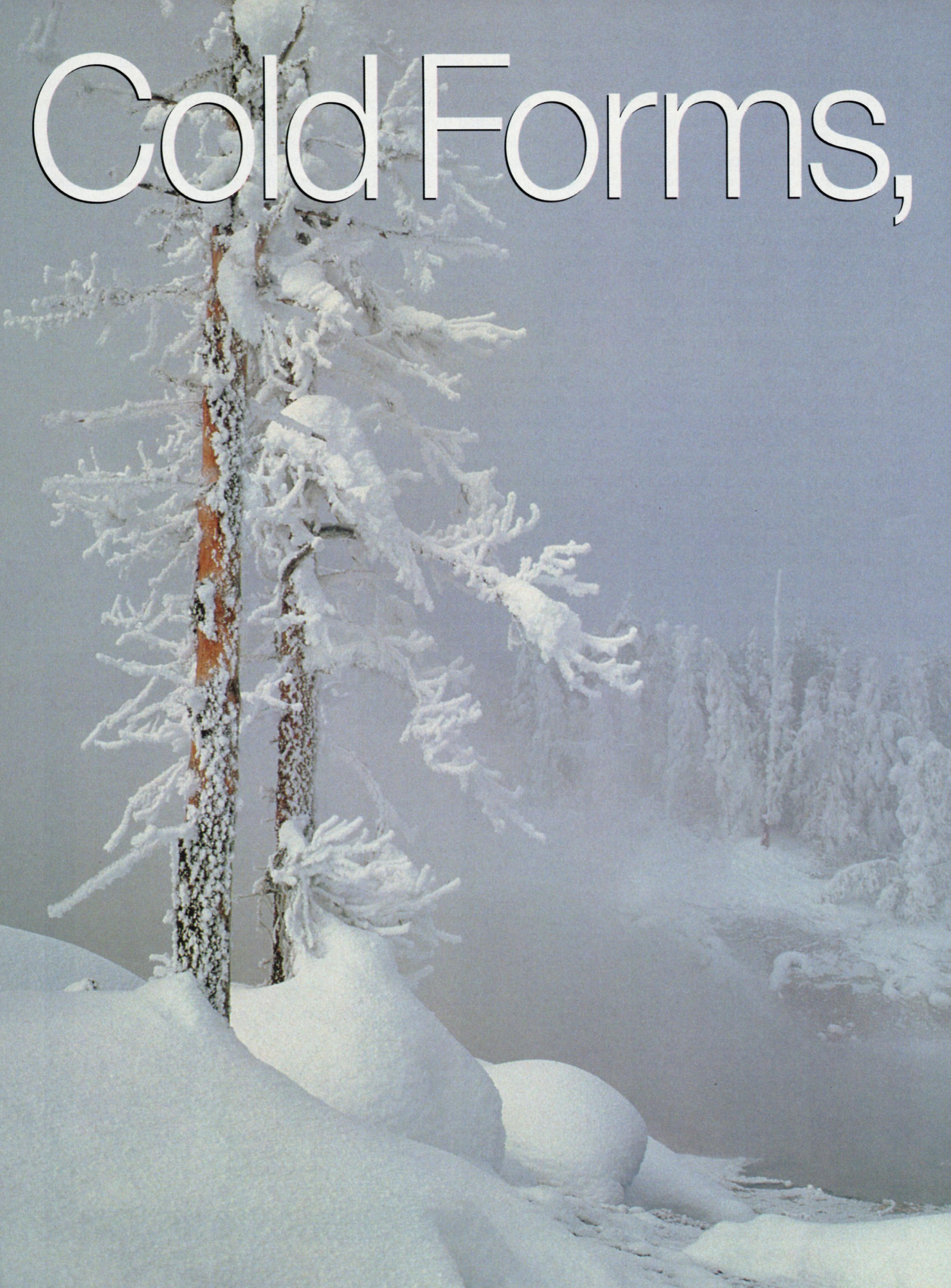

Cold Forms,

Warm Heart

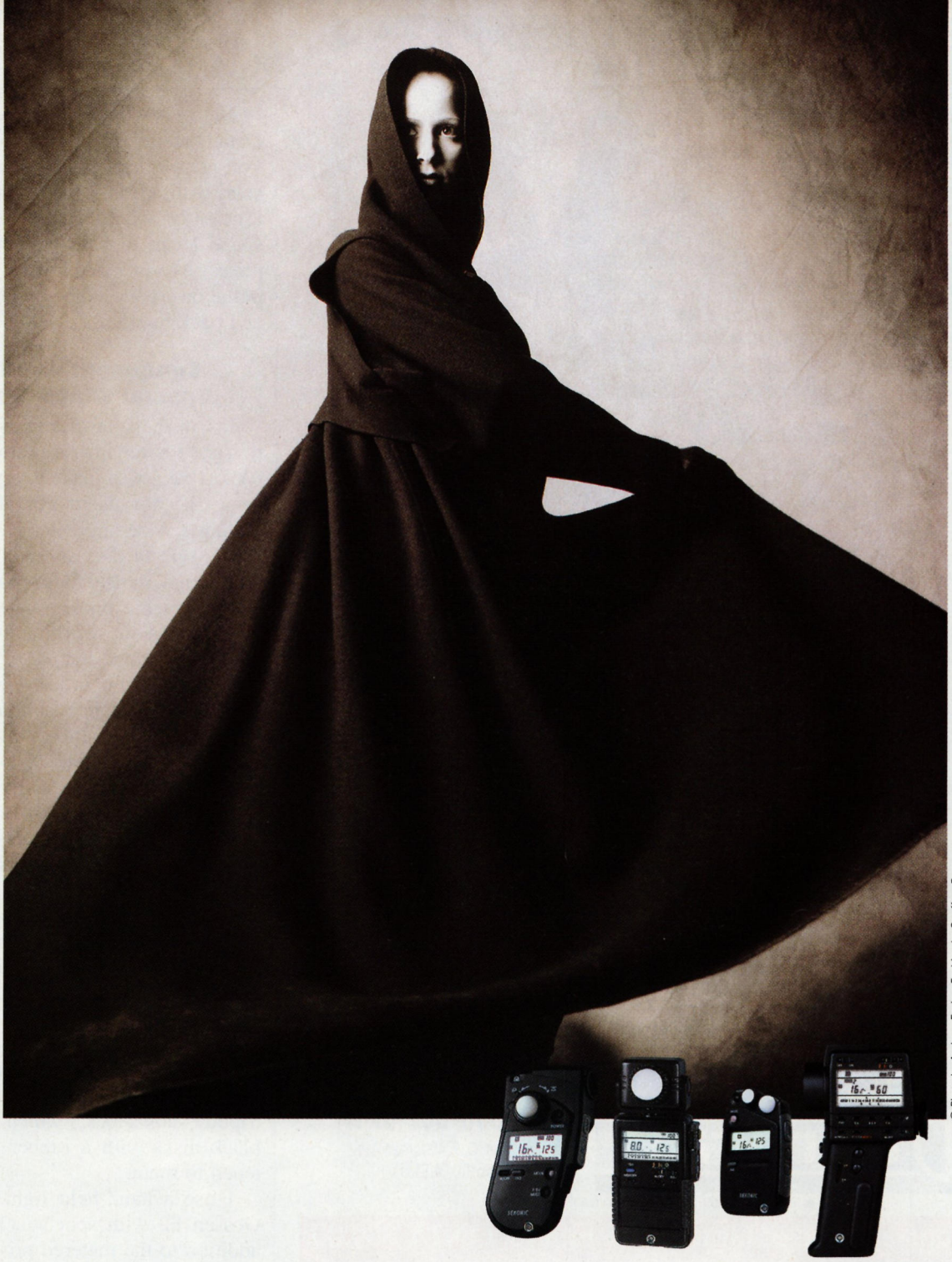
Get great winter shots with our expert's advice on cold-weather clothes and gear

Text And Photography By Judy Holmes

Why do I prefer temperatures in the single digits, monochrome tones as white as the inside of a mothball and precipitation measured in feet, not inches, to a balmy summer eve? Because I want to capture both the *emotion* and the *scene* I'm experiencing—and, for me, that combination produces more memory makers on a frosty January morning in the middle of nowhere than off my back porch in June.

OPENING SPREAD, LEFT: The contrast of the warm colors in the tree trunks and the coolness of the steam rising from the geothermally warmed pool in Yellowstone's Mud Volcano make this a very interesting image. RIGHT: With the lens stopped down, reducing the exposure, detail was sacrificed in favor of increasing the saturation of the warm glow of sunrise in Hayden Valley. ABOVE: In the Lamar Valley in northern Yellowstone, Holmes waited for the dark storm to roll in to give this shot its moody, dramatic feel. INSET: On Cape Churchill, Manitoba, Holmes photographed an arctic fox huddled in the lee of her tundra buggy.

MUD VOLCANO: Hasselblad 500 C/M, 120mm Makro-Planar CF *f*/4, Fujichrome 100; HAYDEN VALLEY: Hasselblad 500 C/M, 140-280mm Variogon CF *f*/5.6, Kodak E100SW; LAMAR VALLEY: Hasselblad 500 C/M, 120mm Makro-Planar CF *f*/4, Kodak Lumiere 100; FOX: Hasselblad 500 C/M, 250mm Sonnar CF *f*/5.6, Fujichrome 100



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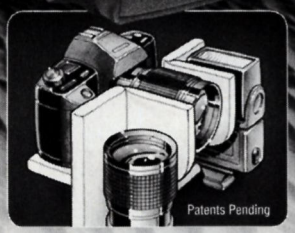

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Cold Forms

Here's how I do it: Simplicity rules. Details matter. Concentration counts. I bring as little equipment as I can get away with, stretch its capabilities, dress efficiently and try to be in the best shape I can to handle winter's surprises. My primary means of transportation are snowshoes, telemark skis and pack boots.

Equipment And Its Special Winter Uses

If I'm the sole means of locomotion and I'm relying on a camera backpack, I've got to make every ounce I bring pay for itself. For all trips, I include a wide-angle in the 30-60mm range; one in the 'normal' range of 80-150mm, mostly for people pictures and to attach extension tubes and filters for close-up work; and a lens in the longer range telephoto or zoom area for moving in on scenics and keeping my distance from animals. I use Hasselblad's 140-280mm zoom and 500mm telephoto.

During winter, especially, it's critical to stay as far from an animal as possible. Some wildlife may not find food for several months, losing more than a pound a day. Bison or elk won't die in January when you scare it into running away because you approached too closely; it will perish in March when it has depleted its store of fat and still can't find food.

My strong, lightweight tripod is the Gitzo carbon-fiber Mountaineer with a Gitzo ballhead. Gitzo even makes tripod "snowshoes," which look like black disks with a rubber cord fastened to them.

I use a hand-held light meter, a Gossen F2 with spot attachment, in addition to the metered prism on my camera. In the winter, especially, with few medium tones for the camera's reflected meter to evaluate, I find that an incident meter gives an accurate opinion, as long as I'm in the same light and holding it at the same angle as the subject. The key is to point the dome toward the camera *at the same angle as you'll be photographing your subject.*

For accessories, I bring a small flash mostly for filling in shadow areas of close-ups. A flashlight is in my gear bag to help determine exposures early

QUICK TIP

For Comfort In Any Weather

Start with the fabric next to your skin. The first layer keeps you safe by insulating your body against the cold and by wicking away moisture when your perspire. The top layer protects you from the elements, and the middle layers provide warmth. Regulate body temperature by immediately adding layers when you cool down and ventilating when you heat up—don't wait and don't be lazy.

Warm Wet—1. Polypro or fishnet briefs on bottom, CoolMax short-sleeved shirt on top, CoolMax socks with ankle-high hiking boots or running shoes. **2.** Lightweight cotton/stretch blend shorts or pants. **3.** Packable Gore-Tex® suit.

Warm Dry—1. Polypro or fishnet briefs on bottom, CoolMax shirt with collar to protect against sunburn. CoolMax socks with ankle-high hiking boots or running shoes. **2.** Lightweight cotton/stretch blend shorts or pants. **3.** Visored hat.

Cold Wet—1. Polypro or fishnet briefs, expedition-weight polypro top, same weight bottoms. **2.** Primaloft top and bottoms, mid-weight fleece jacket on top. **3.** Gore-Tex jacket with hood and pants. **4.** Fleece hat, glove liners, fingerless hunting gloves, overmitts. Polypro liner socks, wool socks, cold-weather boots.

Cold Dry—1. Polypro or fishnet briefs, expedition-weight polypro top, same weight bottoms. **2.** Primaloft top and bottoms, mid- to heavyweight fleece jacket. **3.** Fleece hat, glove liners, fingerless hunting gloves, overmitts. Polypro liner socks, wool socks, cold-weather boots.

and late on short winter days. A polarizer reduces glare on running streams or rivers and provides greater contrast between a blue sky and the snow. I don't overuse the polarizer to heighten contrast indiscriminately.

I use a gray card to double check in-camera metered exposures when I can't find a medium-toned subject or I'm not in the same light as my subject to use the incident meter. Extension tubes in the 16mm to 56mm range, stacked when necessary, provide all the close-up capability I need.

Frequently, I start moving in on a subject such as a frozen leaf, with a close-focusing filter, in Hasselblad language, a Proxar. Filters for softening a scene or close-up (Softars) add a gentle look to your image.

I use a lens hood to protect the lens from moisture or flare. Only in Yellowstone, with its gaseous sprays, do I put on a UV filter. A spirit level keeps those geysers and mountains heading skyward, and a small Swiss Army knife, a couple of cable releases and 10 rolls of film a day complete my outfit.

I love Kodak's new E100S and SW films for transparencies and Kodak's PRN100 and T-MAX films for prints. I've always wanted snow white, not with a blue or lavender cast and, when I trade-tested the E100s last winter, I was impressed that without any filtration, the colors were true, even pushed up to two stops.

For the amount of equipment to bring, the general rule of thumb is to try to keep everything you carry to less than 25 percent of your body weight. It may not sound like much, but after several hours of picking up the equipment, using it and carrying all of it on your back for a full day, you won't have enough energy for a spectacular sunset if you're too tired to concentrate or your body aches.

Besides extra batteries, plastic bags to cover your equipment when not in use (or as a ground cloth) and a lens cleaning cloth, your equipment doesn't need babying in the winter. Moisture and temperature changes are the major considerations, as the cold itself can be handled relatively easily. Ask your camera manufacturer or friends in a local camera club about special considerations for cold and wet conditions. Listen for recurring themes such as: "Batteries die after 15 minutes"; "The battery pack is a must"; "Keep it dry"; and "The autofocus feature slows down."

To eliminate condensation on my lens (caused by large swings in its temperature), I keep it cold, outside my pack and body, all day. This is fine for me because my cameras (Has-

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Cold Forms

selblad's 500 C/M and 503Cxi) don't use batteries and the film doesn't crack, even at 30° F below.

For those worried about keeping the camera warm to preserve battery power, you have a couple of choices—tether the camera to a battery pack you keep inside your jacket or cover the lens with your lens cap and put it inside your parka when not in use.

Prevention is the best way to handle condensation because, no matter how many times you wipe it off, that nasty fog returns until the lens temperature and its environment get in sync again. It seems to take forever. If you want to prove this to yourself, leave the cap off the lens at the end of the day and go inside. See how long it takes to get the lens clear again.

Besides metering techniques special to the winter (or any low-contrast situation, really), here are a couple of tips to capture falling snow as our eye sees it. Try a shutter speed in the 1/15 to 1/60 sec. range to record it showing some motion. If you drag the shutter too much, the precipitation will look like rain. If you use a fast shutter speed, you'll see white circles where you've stopped the snowflake completely. These blobs will usually spoil your image.

Packs

I use a photo backpack for day trips and a standard internal frame pack for longer outings. By this, I mean that if I must carry a tent, food and clothes, I rely on a pack with around 3500 cubic inches of space to hold both my overnight gear and my camera equipment.

First, the day trip: A photo backpack is a good investment for two reasons—it protects your equipment with compartmental padding, and it distributes the weight evenly so you can wear it comfortably for hours. Your camera bag, with a shoulder strap, may be perfect for working out of a car or carrying onto a boardwalk, but it just isn't a good choice when you need your hands free for balance or all your muscles equally exercised during the day.

Here's what to look for in a camera backpack: adjustable, well-padded shoulder straps and waist belt; enough

space to carry your minimum outdoor outfit, plus a water bottle, extra layer of clothing and some food; and extra straps or notches to attach your tripod. I use Domke's two Outpacks—the smaller one for day trips in the field, the larger one for all my equipment and when transporting it from home to my destination.

For overnights, I use the 3500-cubic-inch Mountain Trek Pack by L.L. Bean. SunDog and Lowepro produce well-designed packs, too, which I've used on extensive trips into the backcountry.

For people with special requirements, such as short or long torsos, narrow shoulders or hips or large or small waists, ask for packs with the features you need.

Before you set foot on your winter trip, make sure your pack fits well—straps shouldn't rub and the waist should cinch up tight. Many people make the mistake of wearing the waist strap loose, which puts undue stress on your shoulders and back. You want the bulk of the weight on your hips.

I thread my camera strap through the loop on the back of my pack (so the weight falls on the pack, not on my neck) and then stick my arm through the strap so the camera isn't bouncing on my sternum as I walk or ski. This way, it's always available when I see something I like.

When you have all your gear in your pack, the inclination isn't to stop, take your pack off and dig through to find your camera, especially when you're in a line of five skiers trying to get to the evening's hut 10 miles away. Some of my best winter scenics are what you'd consider the "point-and-shoot" variety.

To make as much of my equipment accessible as possible, I slide two water bottle holders onto the pack's waist strap. I keep a camera lens in one holder, with the other holder containing a water bottle. You've heard of hypothermia and dehydration. In the winter, without help nearby, these can be fatal conditions. I drink an average of five quarts of water a day and munch on pretzels or sports bars whenever I'm hungry. I add or remove layers of clothing as soon as my internal thermostat warns me, no matter how inconvenient it is to stop.

I wear knee-length gaiters, cinched with an elastic cord, in order to keep the snow out of my boots. The cuff-like protectors are a very accessible place to stick an extra film back (my Hasselblads take interchangeable film magazines, so I can make mid-roll slide, print and black-and-white images whenever I want). Gaiters also come in handy for storage of extra film, a hand-held light meter or even some pretzels.

Clothing

Lucky us. We live smack in the middle of the technology era for light, warm, protective clothing. The new materials don't even smell after you've perspired in them all day. The underlayers I wear are made of synthetic materials, with a softness you have to touch to believe. Some of the popular fabrics are called microfleece and CoolMax.

See "Quick Tips" on page 59 for a very simple explanation of layering for warmth and safety outdoors anytime of the day. This is taken from my book, *Eye On Nature.*

For comfort in any weather, start with the fabric next to your skin. This first layer keeps you safe by insulating your body against the cold and by wicking moisture away when you perspire. The top layer protects you from the elements, and the middle layers provide warmth. Regulate your body temperature by immediately adding layers when you cool down and ventilating when you heat up—don't wait and don't be lazy.

Once you have the knack for dressing and hydrating for the outdoors, choosing and packing your equipment and using it effectively for the conditions, there's every reason in the world why you'll agree with me that the winter season is the most beautiful, awe-inspiring time of year. **OP**

Judy Holmes

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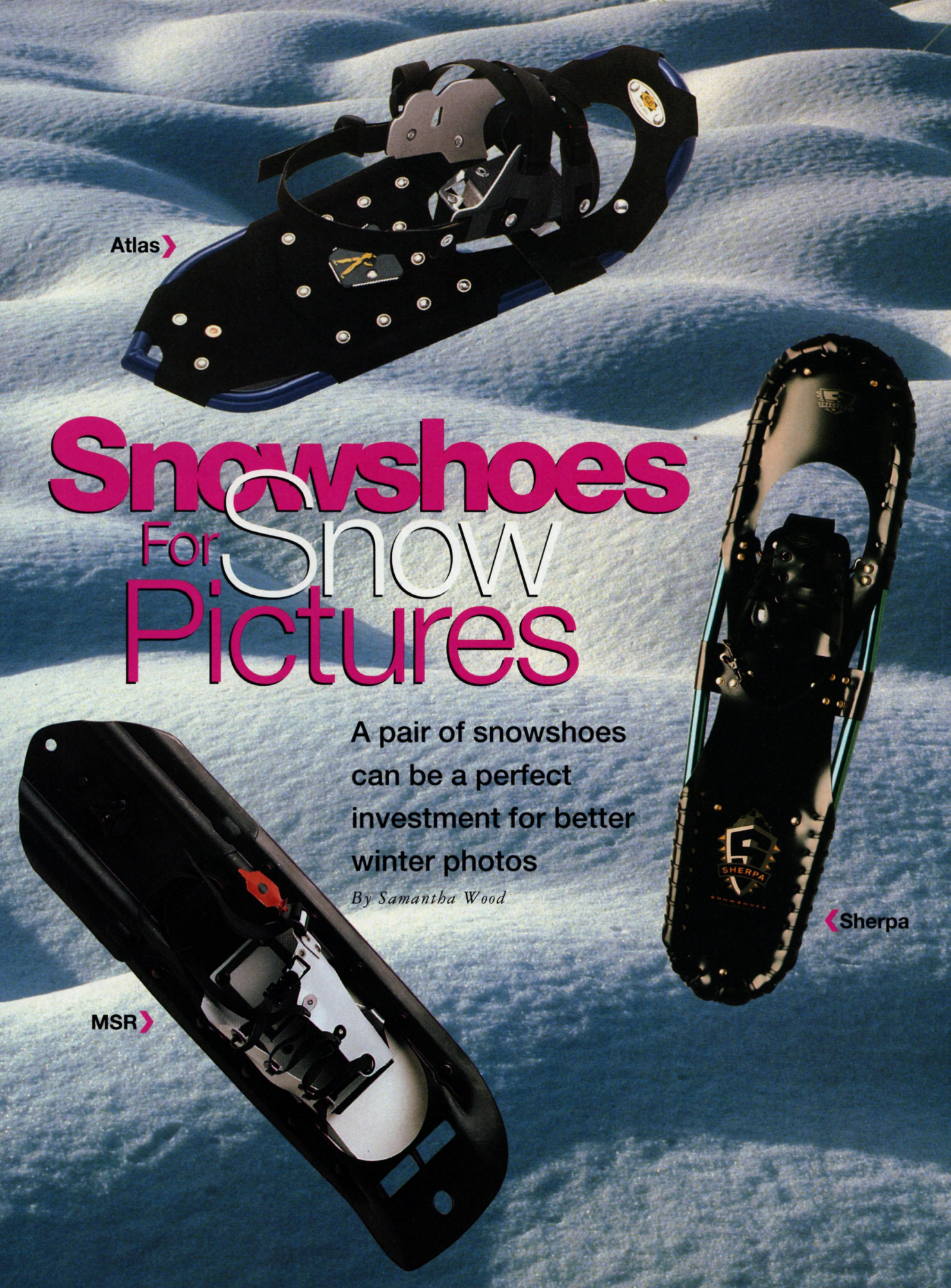

Snowshoes For Snow Pictures

A pair of snowshoes can be a perfect investment for better winter photos

By Samantha Wood

If you want to really get the best in winter photography in snowy areas, invest in a pair of snowshoes. You'll be able to move through deep snow, maneuver for the best position around rocks and trees and thoroughly enjoy your time outside. Snowshoes are fun!

Not too long ago, the only snowshoes you could find were made of wood and leather or neoprene webbing. These types, such as those from **Cabela's (Sidney, NE 69160, (308) 254-6745)**, are still extremely handsome and quite serviceable.

Modern technology offers new choices in high-tech, lightweight alloys and plastics that hold up under the cold. Also, the relatively new sport of snowshoe racing has generated interesting designs made for speed that have resulted in lighter, sleeker snowshoes for general purposes (such as photography).

Modern designs range from inexpensive, low-maintenance injection-molded units to high-tech models that feature tubular frames and flexible webbing and decks.

In the first group, **Mountain Safety Research (P.O. Box 24547, Seattle, WA 98124, (206) 624-7048)** makes the MSR Denali Llama snowshoes from a one-piece platform of copolymer resin with metal traction bars and a hardened steel crampon. For deep snow or heavier loads, you can add a flotation tail to the units.

Little Bear Snowshoes (Spring Brook Manufacturing, 2477 I Rd., Grand Junction, CO 81505, (970) 241-8546) feature one-piece polypropylene construction, with stainless-steel studs for added traction. They come in sizes to fit kids and adults, and in five different colors.

In the tubular-metal frame models, **Sherpa Snowshoes (444 S. Pine St., Burlington, WI 53105, (800) 621-2277)** are classic examples of this design. Its snowshoes have a Dual Rotation hinge action to gain the advantages of both fixed and free hinging. Polyurethane-coated nylon provides an abrasion-resistant deck, while toe and heel claws offer high traction. They come in a variety of shapes and sizes, with varied bindings to meet diverse snowshoeing needs.

ROB SHEPPARD

To Choose A Snowshoe, Consider These Factors

- **Size of "flotation area"**—the main part of the snowshoe that keeps you up. Get the smallest snowshoes that satisfy your needs depending on your size, typical snow conditions and terrain you'll be in.
- **The shoe harness or binding**—depends on what kind of shoe you wear
- **Hinge/pivot or rotation**—a loose hinge with free rotation makes the snowshoe rise easily to the surface in deeper snow; a fixed or rigid hinge is easier to back up in
- **Tailed or tailless**—tailed snowshoes track better for straight-ahead walking; tailless snowshoes navigate better in tight areas
- **Construction**—this affects price, strength and weight
- **Webbing or deck**—some "float" better, others shed snow better
- **Width**—wider, shorter shoes are more maneuverable; longer, narrower shoes are easier to walk in
- **Traction**—traditional snowshoes often have better traction, so modern designs add a variety of traction aids, especially crampon-type fittings, below your foot

Redfeather Snowshoes (4955-D Peoria St., Denver, CO 80239, (303) 375-0410) is well-known for its racing snowshoes and makes all its models track well at any speed. Lightweight

(Cont'd on page 104)

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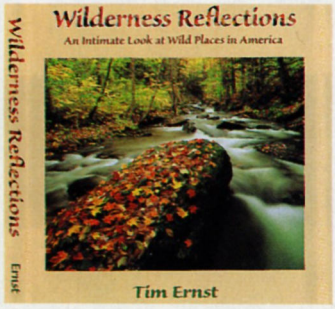

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SEEING the LANDSCAPE part II

Midday Cloudy Light

Bandelier National Monument, New Mexico—Cloudy light allows nature photographers to be productive all day long. The best clouds are pure white and cover the entire sky, allowing no blue to denigrate colors in the landscape. Under these conditions, nature's colors and detail are best portrayed on film.

These ponderosa pines, along with their bark and fallen needles, exhibit immense detail that enhances nature's integrity. The colors are warm and pure, and the composition of an intimate landscape allows the eye to focus on nature's form without being distracted by the sky. Such conditions of light usually last for a relatively long time, allowing the photographer to be more thoughtful and deliberate while making images.

Linhof Technika, Rodenstock Sironar
115mm *f*/6.8, Fujichrome 50

Derived from Greek language, the word *photography* literally means *to write with light.* Different kinds of light contain waves, or pulses, of different lengths. As wavelengths shorten, they appear more blue, and as they lengthen, they appear more red. In between ultraviolet and infrared are the wavelengths that make up the colors of the spectrum we see. The combination of these wavelengths at high noon is seen as white light.

Natural light from the sun actually changes color during the day. The amount of atmosphere through which sunlight passes can change the color of direct light. At the ends of the day, sunlight angles across the surface of the earth, passing through more air molecules, dust, moisture and pollution than at noon. All of this matter allows only the longer wavelengths of light—the warm colors—to reach our eyes and cameras.

Colored light affects colors in the landscape. Just as a painter combines colors of paint on his or her palette to make new colors, so, too, does direct

Part two in a series of lessons on better scenic images based on the new book,

Sunrise

Alpine Lakes Wilderness, Washington—The upper reaches of the Alpine Lakes Wilderness of the Cascade Range is much like the Sierra Nevada of California—snow, ice, crags and water abound. This mountain named the Temple was the dominant feature in the area and offered some interesting possibilities at sunrise. Note the reflection of the pink clouds in the crystal-clear waters of the creek.

The sun rises so quickly that partial blockage by mountains is a short-lived moment. You need to work fast. In clear weather, the mountain would have created a sunstar but, in this case, clouds in the sky diffused the intensity of the sun and prevented that effect.

Linhof Technika, Rodenstock Sironar 150mm *f*/5.6, Fujichrome 50

Sunset

San Mateo County, California—Making this image required more patience than you'd expect. Clouds and warm light intensified by moisture in the Pacific air provided the basis for a good photograph, but the reflection in the sand was the element that made it excellent.

Sometimes the waves ran up the beach much too far and sometimes not far enough. I waited through many wave cycles until just the right amount of sand was wet. Then, I had to wait until the ocean water had soaked into the sand to the degree that a glassy surface formed. Too much water—or too little—wouldn't reflect clouds and cliff. The moment of reflection lasted only a few seconds, allowing for only one exposure at a time.

Linhof Technika, Nikkor 90mm *f*/4.5, Kodak Ektachrome 64

light combine with colors in the landscape to make new colors. This can be good and bad. I hate to see the brilliant royal blues of larkspur and lupine wildflowers turn brownish-blue when a yellow morning sun paints the landscape. At the same time, I adore the warmth of early sunlight as it makes green fields more lovely.

During the day, when clouds cover the sky, many photographers put their cameras away. They shouldn't, for this is one of the great times to photograph nature. The color of clouds, from black to gray to white, reflects upon the landscape. The most obvious benefit is reduced contrast that otherwise might ruin a good composition. White clouds promote the best color viewing and photographing; dark gray clouds tend to dull colors.

The colors of a day fall into three categories: twilight, sunrise/sunset and midday. Although many people think *twilight* only occurs after sunset, it's also a predawn condition.

On clear days, the first color to show is a hint of blue in the lower sky. In time, bands of yellow and red juxtapose with blue, then black. Before

Twilight

White River National Forest, Colorado—I usually begin photographing each day one hour before sunrise and end one hour after sunset. Because exposures usually last for several seconds—depending, of course, on the aperture chosen—using a tripod is mandatory.

Just as the clouds began to turn red, I spied this lone cottonwood tree and pond in the middle of a private meadow. I slammed on the brakes, backed up and pulled into the ranch driveway where I was confronted by the rancher. He was very accommodating when I asked him if I could photograph in his field. Thirty minutes later, I was back on the road with an excellent photograph in the bag (but still without a campsite).

Linhof Technika, Rodenstock Sironar 150mm *f*/5.6, Kodak Ektachrome 64

all this color begins to fade, the sky might boast fuchsia and magenta as well, depending upon the day's atmospheric conditions. On cloudless days, especially when you have a view from higher elevations, the earth's blue shadow appears opposite in the west, topped with a band of pink.

Some days are more dramatic than others. Clouds that can't be seen behind the curvature of the planet can block the passage of the sun as it tries to color the sky. If there are no clouds on the horizon, clouds in the sky begin to take on the color of blood, eventually turning orange, then yellow and occasionally all three at the same time as the sun rises higher. When the last cloud loses its color, the rays of the sun shine directly on the landscape.

Alpenglow refers to the rich red light lasting only minutes just before sunrise and immediately after sunset. At these two times, the light from the sun must penetrate the atmosphere twice: once on its way in toward the earth and out again after only skimming its surface.

High mountain peaks catch this light on its way back out, and only the longest red wavelengths of light are able to make it through. Alpenglow will turn a gray peak red. As the sun continues its rise, the red changes to orange and, by the time you can finally see the arc of the sun peaking above the horizon, yellow.

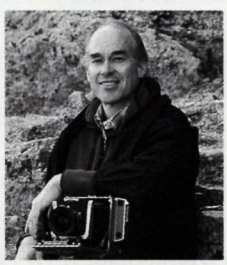
Sunrise is marked by warm, yellow light and strong shadows cast by prominent features in the landscape. Its end is marked by the brightness and whiteness of the light and the shortening of the shadows.

Morning photography sessions can last for up to five hours. Then it's time for breakfast. From 10:00 in the morning until 5:00 in the evening, when the sun is higher than 30 degrees above the horizon, photography on a clear day can be difficult. The shadows are chaotic, and the sunlight is extremely bright. The blue sky reflects its color in shade, and directly lighted colors in the landscape appear dull and "washed out." It's practically impossible to make excellent photographs in these conditions. We pray for clouds.

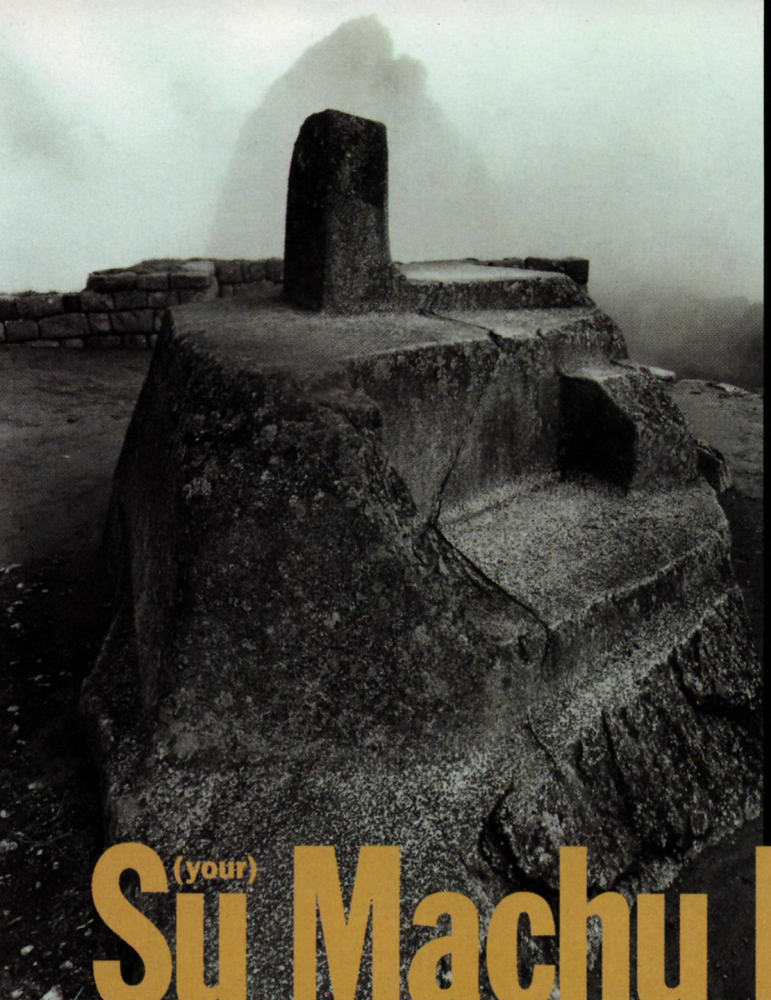
I can be productive throughout a clear day only during the shortest days of winter when the sun never exceeds 30 degrees of angle above the horizon. Shadows are long, and the light is white, but not intense. And with sunrise at 7:00 and sunset at 5:00, there's plenty of time to read and relax at day's end.

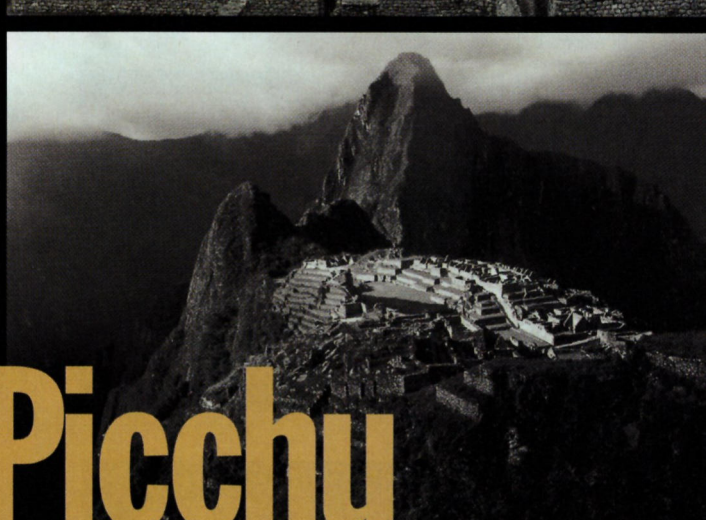
At midday, the best hope for the photographer is to have weather and clouds; not cumulus clouds that allow sunlight through in places to create contrast, but clouds that cover the entire sky. White clouds reflect just the right intensity of light onto the landscape, allowing all of the natural colors of nature to be seen and photographed. Contrast only exists between the light and dark colors themselves, not enough to upset your film and just the right amount to record all of nature's detail.

After midday, the sequence of lighting events continues until dark in reverse of those I described about dawn's twilight, with a couple of exceptions. There are more thunderstorms in the second half of the day than the first, and there may be extra dust in the atmosphere. These two conditions can dramatically affect the number of long red wavelengths that penetrate the atmosphere, resulting in spectacular sunsets and rainbows. **OP**



John Fielder





(your) Su Machu Picchu

Whether you arrive by train and bus, as most tourists, or as one of the hardy few, at the end of a five-day trek on the Inca Trail, the effect of setting eyes on Machu Picchu for the first time is the same for everyone: awe-inspiring. There's no escaping the sense of personal discovery, though realizing full well that you're walking in the footsteps of countless visitors who have come before.

For the photographer, the first impulse is to duplicate for one's self the signature picture of the place (above at lower right). Then, the challenge—as with any world-famous destination—is to find amongst the legendary ruins and misty mountains those pictures that are like no others made before. Your interpretation. Your (*su*) Machu Picchu.

When international photographer Chris Rainier and actor/comedian Joe Piscopo came for a recent episode of Canon Photo Safari, they chose the less conventional black-and-white approach. It's an excellent medium for rendering the ancient walls and terraces. It foregoes the distraction of color (or lack of it) and emphasizes light and shape as though each granite block is a unique sculpture in stone, each edifice an architectural exercise.

The clouds around the mystical ruins made the constantly changing light levels very deceptive. Chris relied on the high-tech metering system of his Canon EOS-1N to read these changes and give him perfect exposures on every shot. This kind of advanced metering let Chris and Joe explore Machu Picchu, concentrating solely on capturing the magic of the ancient Inca site.

Considering the incredible array of views that Machu Picchu offers, Chris was glad he had the Canon EF 17-35mm ƒ/2.8L USM zoom lens. The lens' great range and super-sharp optics allowed him to create strong compositions such as using foreground detail, leading to a powerful background design element in the picture frame.

Deborah Hutchinson ©

Machu Picchu required a range of different focal lengths. Chris and Joe used the Canon EF 28-80mm ƒ/3.5-5.6 IV USM. The lens covers the gamut from telephoto all the way down to wide-angle, and its one-foot four-inch close-focus distance allows for macro possibilities as well. As a world traveler who's ever mindful of weight and bulk, Chris really appreciates having such a multifaceted tool.

Canon

PHOTO SAFARI

The Canon Photo Safari airs on ESPN® Saturday mornings through Dec. 28. Look for it to return in the fall of 1997.

Chris Rainier's new book, Where Masks Still Dance *(Little, Brown and Company), is currently available at bookstores.*

Photo Critique

Winners From The Great American Photography Weekend 1996 Series

In 1996, the Great American Photography Weekend workshops visited some of the most beautiful locations in America with some of the most talented teachers in the field. At each program, a contest was held to select a "Best Workshop Photo." *OUTDOOR PHOTOGRAPHER* is one of the sponsors of this workshop series, and on these pages we present the winners as inspiration to all of us. By being in the right place at the right time, with the right instructor, students can achieve remarkable professional-quality images.

For further information about the Great American Photography Weekend workshops, call (606) 523-1653.

© Jim Sutton

Jim Sutton

Cashmere, Washington • Banff National Park, Canada
Nikon N90, Nikkor 35mm *f*/2, Kodak Lumiere 100
Careful framing and wonderful attention to detail in the composition helped Jim bring this beautiful scene to life on film. The shot was made at *f*/11 with a sturdy tripod and a polarizer. Jim waited until the light was balanced and allowed good exposure in both the lake and the peaks.

© Dan Creighton

Dan Creighton

Hatboro, Pennsylvania • Cape May, New Jersey
Nikon F3, Nikkor 105mm Micro, Kodak Lumiere 100
This arresting image of a crab was done with exacting composition and precise close-up technique—small aperture, sturdy tripod and carefully controlled overcast light. Dan's photograph is what John Shaw calls "Photo-Graphics" at its best.

© Joyce DeBoard

Joyce DeBoard

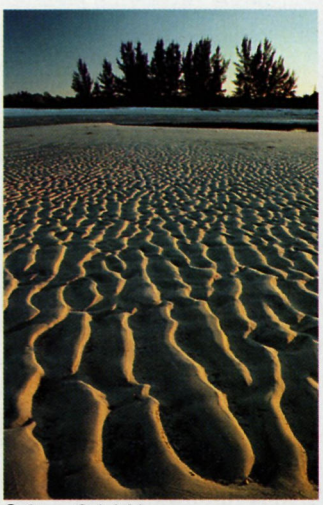
Tulsa, Oklahoma • Arches National Park
Nikon N8008, Nikkor 300mm, Nikkor 35-135mm zoom, Kodak Lumiere 100
This double exposure created a spectacular effect. First, Joyce photographed the nearly full moon with a 300mm lens, carefully marking the spot of the moon in the frame. At dusk, with just a hint of color left in the sky, she recomposed and double-exposed the arch with her 35-135mm zoom. The combined image speaks for itself.

© Marv Binegar

Marv Binegar

Oregon City, Oregon • Desert Southwest
Canon EOS-1N, Canon 20-35mm zoom, polarizer, Fujichrome Velvia
Marv used a low angle of view and great depth of field to capture the saguaro cactus and desert brittlebush against the deep-blue Arizona sky. Sharpness was maintained by waiting for a lull in the wind and by using a sturdy Gitzo tripod. A polarizer helped bring out the rich colors of the Sonoran Desert flora.

© Sharon Gerig



© Stan Grigiski

Photo Of The Year

Susan Gibler
Jackson Hole, Wyoming
Grand Tetons National Park
Nikon N8008, Nikkor 28-85mm, Kodak Lumiere 100
Susan's image won her "Best Overall Photograph of the Year." She used the wide-angle end of her zoom and an 81B warming filter to catch the early-morning light falling on this field of lupine and the Grand Tetons. A small aperture provided great depth, and patience provided a moment of no wind for a sharp image throughout.

Sharon Gerig
Monroeville, Indiana • Great Smoky Mountains National Park
Nikon N90s, Nikkor 105mm Micro, polarizer, Kodak Lumiere 100
Sharon captured this single fern fiddlehead with a water droplet by using a plain background with excellent control of depth to allow only the subject to be sharp and clear. The use of a polarizer cut the water's reflections and deepened the lush green forest bottom.

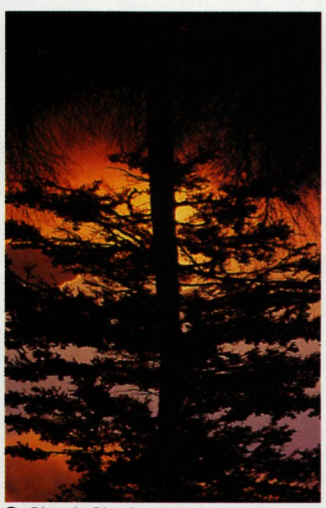
Stan Grigiski
Cape Coral, Florida • Sanibel Island, Florida
Canon EOS Elan, Canon 20-35mm zoom, Kodak Lumiere 100
Stan's photograph displayed an often taught compositional principle at the GAPW: "Use the foreground to your advantage." By stopping down his wide-angle zoom to *f*/16 and using hyperfocal distance, he was able to let the great light on the rippled sand in the foreground actually become the major feature of this wonderful landscape shot.

Chuck Shade
Miamisburg, Ohio • Blue Ridge Mountains
Nikon N8008, Nikkor 75-300mm, Kodak Lumiere 100
At the summit of Grandfather Mountain in the Blue Ridge Mountains, Chuck made a great composition of a conifer in sunrise light. Exposure for the sky and clouds left the tree in perfect silhouette.

John Stark
Lodi, California • Olympic National Park
Nikon N8008, Nikkor 105mm Micro, reflector, Kodak Lumiere 100
Excellent close-up technique and a lot of careful searching for a near-perfect specimen produced this striking image. John used a macro lens and perfect depth to hold detail in the Columbia lily and the fern background.

Irwin R. Barrett
Bedford, Nova Scotia • Acadia National Park
Canon T-90, Canon 28mm, Fujichrome Velvia
The subject of Irwin's photograph is Otter Cliffs in Acadia National Park, Maine. The great light and graphic design makes this an especially strong composition.

Dale Stockton
Carlsbad, California • Point Lobos
Canon EOS A2, Canon 28-105mm zoom, Kodak Lumiere 100
Dale found a great scene along the rocky coast with seastars left by the high tide. By using a low angle of view and lots of depth of field (*f*/16), he was able to capture both a seastar and rocky coastal foreground as well as the deep-blue Pacific Ocean in the distance. A polarizer helped reduce reflections and deepen the color saturation.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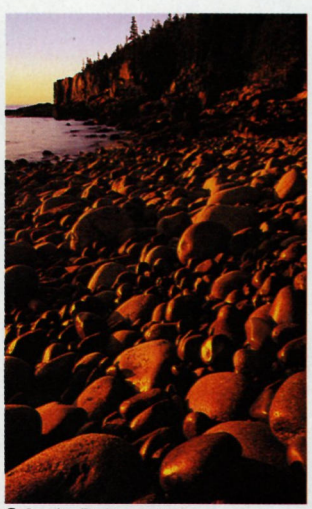
© John Stark


© Irwin R. Barrett

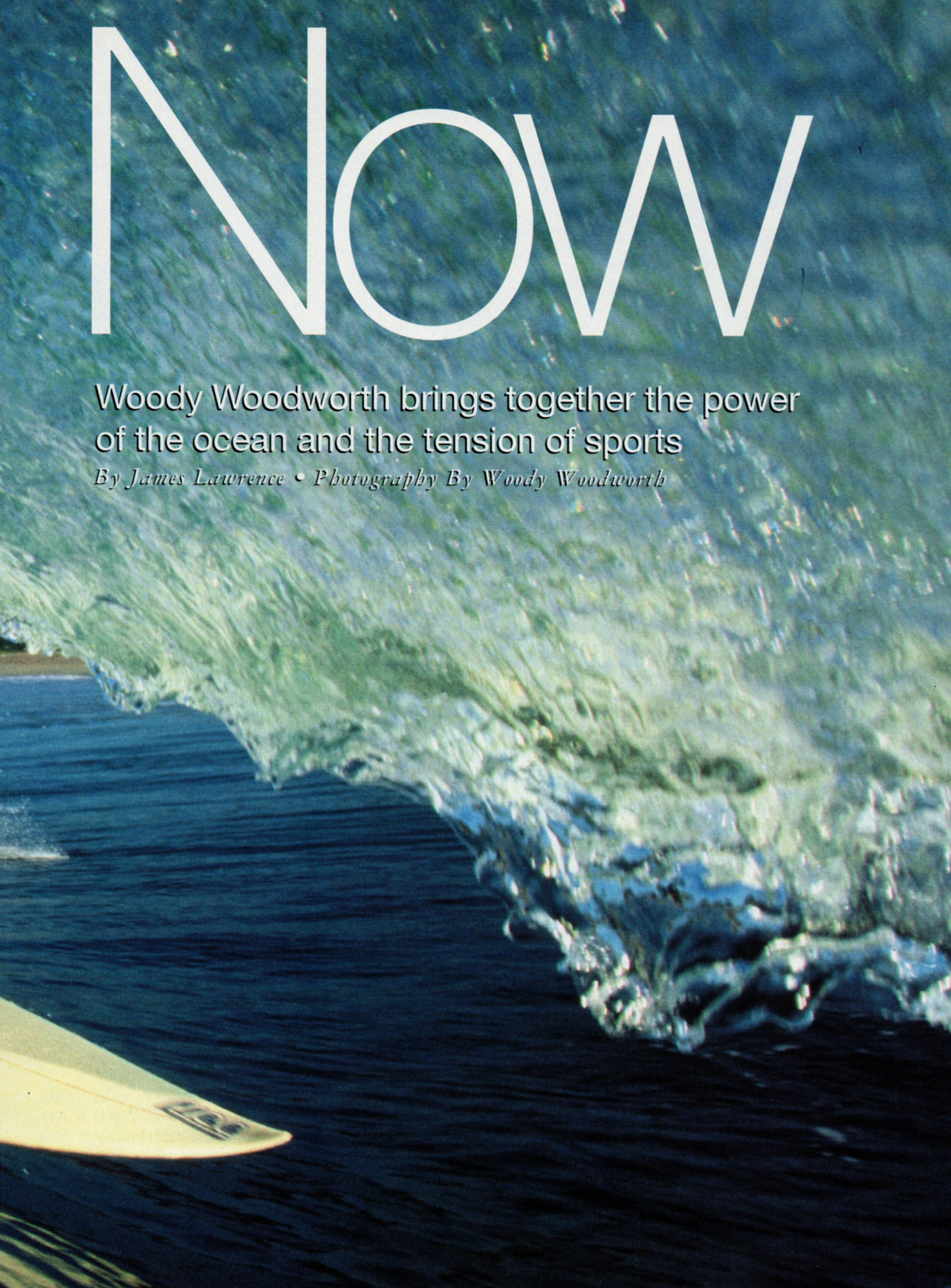
© Dale Stockton

LET'S GO
Surfin'

Now

Woody Woodworth brings together the power of the ocean and the tension of sports

By James Lawrence • Photography By Woody Woodworth



← ***PREVIOUS SPREAD: A 20mm focal length puts the viewer right into the curl of the surf action. Such action requires close communication with the surfer so neither the photographer nor the surfer gets hurt.***

Canon EOS-1N, Canon 20-35mm *f*/2.8, Fujichrome Velvia rated at EI 64, then push-processed one stop

Catch a wave, and you're sittin' on top of the world. That is, if your name is Woody Woodworth and surfing/wave photography is your thing. In his 24 professional years of shooting surf action, the trim and fit photographer has "shot the curl" better and more thoroughly than probably anyone else in the world.

Woodworth's work is everywhere. His dynamic imagery

of all those foam board dudes and dudettes working the big water has graced many of the 55-odd surfing magazines around the world. He's been on the masthead of *Surfer Magazine* alone for 22 years. *The Book Of Waves,* a highly successful coffee-table book of transcendentally beautiful wave form photography, reveals his refined eye for spiritual beauty.

As with many artists, Woodworth didn't make a career by following the beaten path. "My surf photography is

↑ ABOVE: A 100mm focal length gives an entirely different perspective on the action than the previous wide-angle shot. INSET: A skimboarder kicks up the spray, captured with a fast shutter speed, while fill-flash brings up the colors.

CURL: Canon EOS-1N, Canon 100mm *f*/2.0, Fujichrome Velvia at EI 64; SKIMBOARDER: Nikon F4, Tokina 28-70mm *f*/2.8, SB-24 Speedlight, Fujichrome Velvia at EI 64

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SURFIN'

definitely more multi-level than a lot of shooters out there," Woodworth says. "For me, it's about that awesome, ominous shape that heaves up out of the water and lights up like a cathedral."

Yet there's a hard-core business brain at work, too, as he notes that empty wave shots don't garner the $500 to $1,000 usage fees from surfing gear sponsors. "But I do get those fees over and over again by shooting more generic surf imagery because those shots say surfing and a lot more. They're timeless because they're not attached to a brand name, logo design or era."

Woodworth broke in at the right time, when surfing was still a national craze, but not everybody was out trying to make a living at it—unlike today, when 50 to 100 big-glass shooters will crowd together on a happening beach, set up their tripods and all go for the same front-lit, product logo-identifying surfing shots.

The problem, inherent in other genres of professional photography, is the constant stream of new shooters who will do anything to break in. They figure they'll give their work away cheap until they get established, then jack up the price. Guess again.

"When you sell it for a song, you jeopardize your ability to go down the road and live your photographic dreams." The publications simply go to the next naive newbie coming up and buy his or her work cheap.

"That's one of the reasons why I'm a heavy advocate of the ASMP [American Society of Media Photographers] for anybody who wants to make a serious career out of photography," Woodworth says adamantly.

ASMP supports professionals with practical advice and guidelines on what it takes to run a photography business. "If you don't know what your photography is costing, and you don't have a business plan, there's no way you can make a legitimate business out of it."

One way Woodworth avoids market obsolescence is by skipping the cliché "production surf" beach shots in favor of more dynamic perspectives from a nearby hill, cliff or airplane. That's only when he's not in the teeth of the wave, getting the quintessential in-your-face surfing shots that helped make him famous.

"Beach shots are always the same: motordriven action photos made with big lenses. Very static, very two dimensional." Woodworth is happier in the water anyway. "I was the first guy on the North Shore of Oahu to put a Canon EOS-1N in a water housing and shoot in the big waves." That same camera and setting yielded a dynamite water-level sequence that was published on the cover of *Surfing Magazine.*

A Canon A2 also gets frequent usage, with a 300mm *f*/4 for land-to-sea shooting rigged up with a 1.4X doubler that yields a 420mm focal length. "Fast, light, compact and easy to work with."

QUICK TIP

Many surf and water action photographers shoot Velvia pushed to an Exposure Index of 64, then have the film push-processed by the lab. This gives them an extra stop of speed, but also intensifies the color and contrast. That intensity is usually too harsh for standard nature photography, but can add punch and power to the bright sun and waves typical of surf shooting.

Woodworth's recommendation for good surf-action shots includes a range of lenses from 20mm to 800mm. His mainstays are the Canon 20-35mm *f*/2.8, 28-70mm *f*/2.8 and fixed focus 100mm, 200mm and 300mm. Back those up with Canon's 1.4X and 2X extenders and you're stylin'!

For the big glass, Woodworth likes his Nikon F4 and 800mm *f*/5.6 and 2X doubler. The 1600mm combo is used for more evocative mood shots, such as gigantic setting sun silhouettes.

In the water, the five to six frames per second speed of the EOS-1N gets the nod. He'll use lenses up to about 135mm. Anything bigger makes framing too difficult in the constant motion of the waves.

What about those great "tube" shots where it looks like the surfer is right on top of the camera and the wave is right on top of him? It looks like that

for a reason: They *are* right on top of him—he's using a super-wide 20mm!

To capture these kinds of shots requires certain essential survival tools. A wet suit is mandatory. You don't want to "get reefed" by being dragged across rocks or coral without skin protection.

Other essentials include sunscreen, sunglasses and neosporin, especially in tropical locations. "Staph infections are everywhere in the tropics. Down in the southern hemisphere, with the ozone holes, I've had red bands sunburned across my eyes from the sun. You've got to be sure to protect yourself all the time."

Most in-water shooting sessions depend on a good photographer/surfer relationship. The surfers are aware of the symbiotic benefit of working with photographers. Woodworth will tell a surfer he's using a 20mm lens. "Right away, he knows our working distance is going to be four to six feet. If I tell him I'm going out with a 100mm lens, he'll keep his distance."

And then there's the big water, as in tons of it. One word says it all: Hawaii. Woodworth describes one memorable occasion.

"I dove in directly in front of the massive peak of the wave after a set of waves went through, then swam like the devil as I got caught in the riptide. The idea is to gauge distance as you're being swept down the coast so you can move outward in time to hit your spot. It's a real eye of the needle."

All with a seven-pound camera, which meant one hand wasn't free. Nowadays, he uses a back strap to let both arms work.

The waves were cresting at 15 to 20 feet, lethal in size. "I made it out to the lineup. The waves were coming from the other side of the reef. I turned around and saw this incredible wave. And a surfer had caught it! One guy! We couldn't stop howling. It was the most awesome wave we'd ever seen there. It hit the reef and just launched."

He shakes his head, reliving the memory. "It was one hell of a dramatic moment. And I had this new EOS-1N autofocus whoop-dee-doo camera. I fired away and got the most sequences of that wave. Everything turned out sharp and wonderful."

On a good day, two or three waves,

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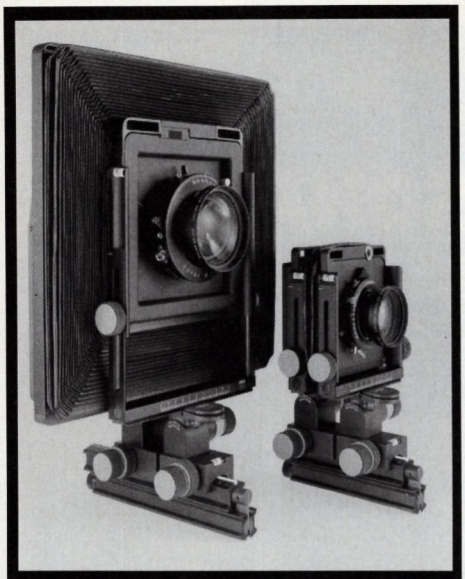

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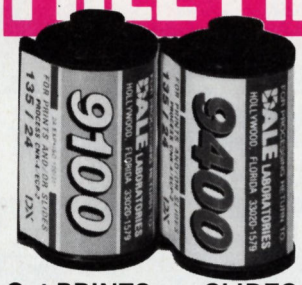

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SURFIN'

and he's out of film. Then it's back to the beach. After a super-careful changing of film—one drop of salt water inside a camera and it's ruined—it's back on with the swim fins, back out into the water.

You might call the Woodworth technique *light priority*. "Light is *the* key ingredient for surf shots." Typically, the light changes from morning frontlit to afternoon backlit. Then the winds come up. Now the mix of lighting and water becomes richly complex and ever-changing.

Like a painter, he speaks of light that is "mottled, muted and refracted. You've got pinks up high in the sky, oranges down low, reflections off the cliffs, and all of it's going through or bouncing off the water.

"I've loved it from the day I first started shooting. To see the golden rays coming down through the back of a wave, cracking into ambers, reds, golds and greens intermixed. Give me that any day."

How to accurately meter all that changing light? Woodworth finds he trusts his EOS-1N more than previous in-camera meters. "It's awesome, although there are still those instances where I don't use it."

One of those instances is on the beach with frontlit sun. "That's always 1/500 sec. at *f*/5.6 with EI 64." The EI 64 rating is for Fujichrome Velvia. Like many of his contemporaries, Woodworth considers the film an ISO 32, then shoots at EI 64 and has the lab push-process one stop.

"My next dream is to go to the Philippines. Think of it—7000 islands in the group, so many little bays, nooks, crannies." He smiles, "And not one major highway on any of the coastlines." OP

Don't miss ***Woody Woodworth's*** *Web page at http://www.webcom.com/woody.*

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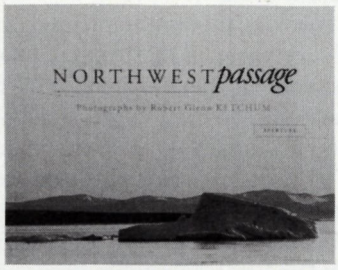

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Where the photographer had a lesson in composition while trying out the

Framing C

Although we wondered a little about the Advanced Photo System (commonly called APS) at first, we love it. It's fun, challenging and features new creative ways to photograph the world.

With new cameras now being offered that bring full control and interchangeable lenses to the format, APS is definitely a valid choice for serious photography. One of the most intriguing aspects of the format is the chance to vary your shooting frame in one of three ways—C, H or P. Although some uninformed people have tried to diminish this feature as simply "cropping," it really isn't. Each framing demands that you think differently and can really expand your compositional choices if you work to get the best images possible.

We found this out in a hurry when we decided to take Canon's EOS IX Advanced Photo System camera to a soccer game to capture some sports-action (we also got a bit of attention because of the stylish, stainless-steel finish). We used a zoom-telephoto lens designed for 35mm, the new Sigma 70-300mm *f*/4-5.6 APO macro lens, because it offers about 25 percent more magnification for APS than when on a 35mm camera.

A neat thing about the EOS IX is that you can use any lens with an EOS mount on this camera. You could switch lenses from an EOS Elan II to the IX in moments.

Changing the format framing, then challenging ourselves to shoot that soccer action in an interesting way that fit the frame, was an exhilarating exercise. We can't think of anything we've done in recent years that made us think harder about composition and how to really work the image frame.

The EOS IX makes it very easy to make the change among frames. You simply push your thumb against a small, perfectly positioned button on the back near the viewfinder to cycle through C (traditional fram-

The Advanced Photo System's three framing choices, C, H and P, offer the photographer some wonderful creative options in composition. This isn't the same as cropping after the photography as can be seen in the flower shots, right. The same subject definitely looked better from different angles when the framing changed. Working your compositions to a specific frame as you shoot means you use that frame most effectively. Above, the wider H framing definitely lets you in on a range of action, while the very wide P framing focuses attention on a range of interesting details, from left to right. The traditional C framing works perfectly for a quiet moment.

SOCCER: Canon EOS IX, Sigma 70-300mm *f*/4-5.6 APO Macro, Fujicolor Smart Film H400; FLOWERS: Canon EOS IX, Canon 24-85mm and extension tube, Kodak Advantix 100

Text And Photography By Rob Sheppard

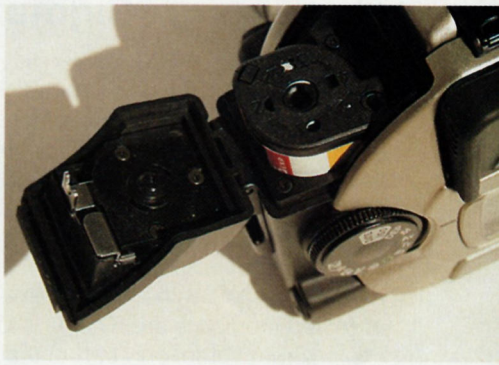
hoices

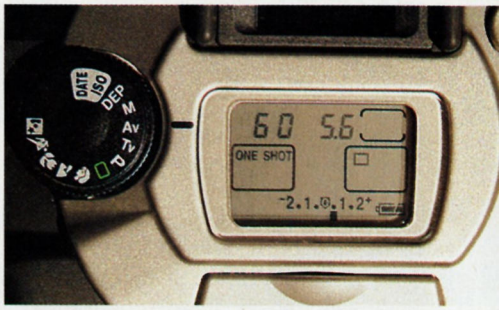
ing), H (named for the wider HDTV format) and P (panoramic).

The camera controls are easily accessible, with a large LCD panel on the back that shows all major functions. At the left side of the back is Canon's now-standard, easy-to-use command dial that shows all of the camera's 10 exposure modes. The IX includes a six-zone evaluative meter that can also be set to partial (6.5 percent) and center-weighted. The system does include E-TTL flash exposure, with an exposure lock possible with the 220EX or 380EX Speedlites. This allows you to "preset" your flash exposure on off-center subjects.

Exposure is rarely recorded by pros nowadays because of the superb automation in metering and the extensive bracketing the pros often use. But sometimes exposure information can be helpful as you're experimenting with *f*-stops or shutter speeds. Still, it can be a pain to do. The EOS IX records exposure information on the magnetic coating of the APS film, then the processor prints the frame number, cassette number and exposure on the back of the print. You can't misplace this information.

Trying to follow a fast-moving soccer game and look for good compositions in new frames was, to say the least, stimulating. The camera's autofocus system did a good job, so we





▲ ***The EOS IX is a compact, stylish design, featuring a brushed metal and black finish. It comes with a new Canon EF 24-85mm f/3.5 USM lens. APS loading is truly "drop in and shoot" and features an extremely flat film plane. Controls on the IX are easy to find and quite handsomely designed into the body. The large LCD panel on the back offers a convenient and easy-to-read information display.***

Sigma 70-300mm *f*/4-5.6 APO Macro

The Sigma 70-300mm *f*/4-5.6 APO Macro lens mentioned in the EOS IX article isn't an APS lens. It just happens to work great with the IX, offering an extra 25 percent magnification with that format. We also shot the lens with traditional 35mm equipment and found it would be an excellent addition to any photographer's gadget bag when the 70-300mm focal lengths are needed.

Using the lens with an APS camera shows how well-corrected the optics are. The APS format doesn't use the whole 35mm frame; only part of the lens' covering power is used. A smaller area is enlarged, meaning that any defects or sharpness problems are also magnified. The lens performed as beautifully with APS as with 35mm.

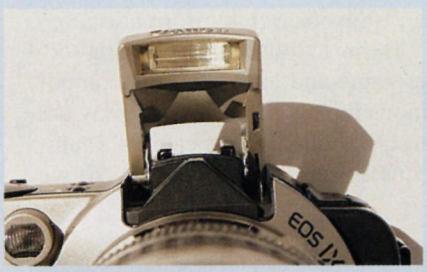
Sigma has taken an interesting tack with its longer lenses, making many of them capable of close-focusing to macro distances. The effect of a long lens on a close-up can be stunning, plus it offers a longer camera-to-subject distance, important with skittish insects, for example. This 70-300mm zoom includes that macro-focusing feature at 300mm (not at the wide focal length typical of many other zooms), offering up to a 1:2 reproduction ratio (focusing to 37 inches; 59 inches normally).

Construction details: 14 elements in 11 groups (four groups zoom), minimum aperture *f*/22-*f*/32, rotary zoom, 58mm filter size, 3x4.6-inches, 20.8 ounces, Sigma ZEN finish on exterior; a bayonet-mounted lens hood is included.

For more information, contact: Sigma Corp. of America, 15 Fleetwood Ct., Ronkonkoma, NY 11779, (516) 585-1144.

Specifications: Canon EOS IX APS SLR

Camera Type: APS SLR
Format: Advanced Photo System
Lens Mount: Canon EOS EF mount
Focusing: Three-point autofocus, manual
Focus Screen: Laser-matte screen
Exposure Metering: TTL six-zone evaluative, partial (6.5 percent) and center-weighted (manual); TTL off-the-film flash metering
Exposure Modes: Shiftable program AE, shutter-priority AE, aperture-priority AE (including depth-of-field mode) and manual; six Image Zone programs (full auto, portrait, landscape, close-up, sports and night)
Exposure Compensation: ±2 EV in ½-steps
Shutter Speeds: Electronically controlled 30-1/4000 sec. in half-step



increments, plus Bulb
Film Speed: ISO 25-8000 set automatically with DX-coded cassettes; ISO 6-8000 set manually
Viewfinder: SLR-type, eye-level prism with high-reflection mirror
Viewfinder Display: Superimposed LCD with AF frame, focusing points, C/H/P format masks and partial metering circle; shutter speed, aperture setting, AE lock, exposure level scale, flash indicators, in-focus indicator
Depth-Of-Field Preview: None
Film Loading And Transport: Foolproof APS loading, including automatic mid-roll change, automatic film advance; single-frame, continuous 2.5 fps, remote control
Flash Sync: 1/200 sec.
Self-Timer: Electronic; 10-sec. delay
Power Source: Two 3V lithium cells
Dimensions: 3.2x5.28x2.3-inches
Weight: 16 ounces
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(Cont'd on page 100)

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STRAPS!

Gain comfort and control over your camera and gadget bag with the right accessory strap

By Glenn Terence

SunDog ›

‹ Lowepro

If there's one piece of photography equipment that goes unnoticed and unconsidered and pretty much unsung, it's the strap. Really, how many times have you ever sat down and thought about what kind of strap you should have for your camera or gadget bag? I don't mean that you need to ponder long into the evenings, just that there are options available. There are padded straps, bouncy straps, neoprene straps, leather straps, oversized straps, straps that hug the gear to your body, straps that are contoured to stay on your shoulder.... So, if you don't like the strap that came with your camera or gadget bag, the one that you want is out there, just waiting for you to find it.

Domke

Domke is well-known for its subdued-looking camera bags. To keep them secured on your shoulder, Domke makes the Gripper Straps. These nifty straps have a non-slip track woven into the canvas fabric that ensures that they stay where you sling 'em. Available in tan, black and gray, the Gripper Straps are 1½ inches wide.

Other interesting accessories from Domke are its shoulder strap pads. The Shoulder Pad and the Euro-Style Shoulder Pad slip on any standard-sized shoulder strap (up to 2¾ inches wide for the Shoulder Pad and 2 inches wide for the Euro-Style pad) and make carrying a bag an easy task. If your gadget bag tends to be a bit on the weighty side, one of these pads can be a big help in keeping you comfortable all day long.

Domke also offers a variation on the Gripper Strap for your camera. The Gripper Camera Strap features the same woven-in non-slip track as its wider siblings, but it's only one inch wide. The Gripper Camera Straps are made in a standard model or a quick-release model, which allows you to disconnect the strap from the camera instantly via a pair of rugged metal clips.

Lowepro

The folks at Lowepro have a well-deserved reputation for producing camera bags and straps that are functional and extremely well-designed and well-built. Lowepro's heavy-duty Deluxe Shoulder Strap certainly lives up to that reputation. The shoulder pad has a non-slip surface to keep it from sliding around, and it's contoured to make it

‹ Zero Halliburton

very comfortable. Lowepro gave its Deluxe Shoulder Strap metal hardware with universal swivel clips that are strong and keep it from getting twisted up. In fact, the hardware is strong enough so that you can use the strap for heavier luggage when it's not attached to your gadget bag.

Lowepro also makes interesting accessory straps for some of the Lowepro bags, in particular, the Backpack Harness and the Chest Harness. The Backpack Harness attaches to the larger Lowepro Pro and Nova bags, comfortably holding them right side up without swaying around. The Chest Harness is made for the Lowepro Topload Zoom packs. The harness holds the pack against your chest where you can quickly grab at the camera and get the shot. The Topload Zoom packs have been specifically designed for active outdoor photography and the Chest Harness helps give them added stability.

Op/Tech

Made in a slew of styles for all sorts of purposes, Op/Tech camera straps are super-comfortable. Incorporated into its products is soft, stretchy neoprene. Op/Tech has a flair for looking at the different ways people use its camera straps and coming up with a product that's ideally suited to the task.

For instance, Op/Tech has a strap that's specifically designed to carry and protect your camera while bicycling, running or participating in other activities that might cause the camera to bounce around excessively.

Op/Tech

Visual Departures Ltd.

Zing Designs

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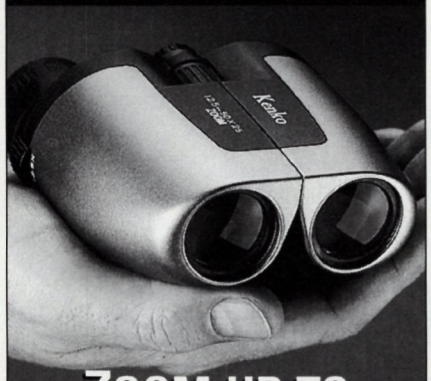

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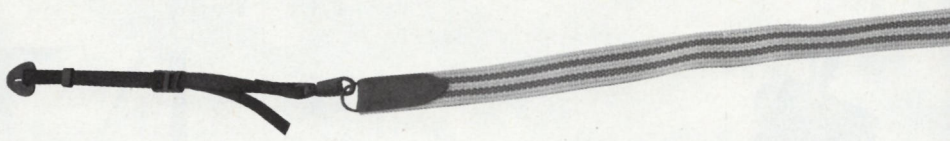


Another nice product is the Op/Tech wrist strap for your camera. Many people prefer not to have the camera hang around their neck, so the wrist strap allows you to have the camera in your hand, safely tethered to your wrist. If you should get jostled or bumped and lose your grip on the camera, it won't go crashing to the ground. The strap is secured around your wrist with Velcro for a good fit and features a quick-release clip if you want to mount the camera on a tripod.

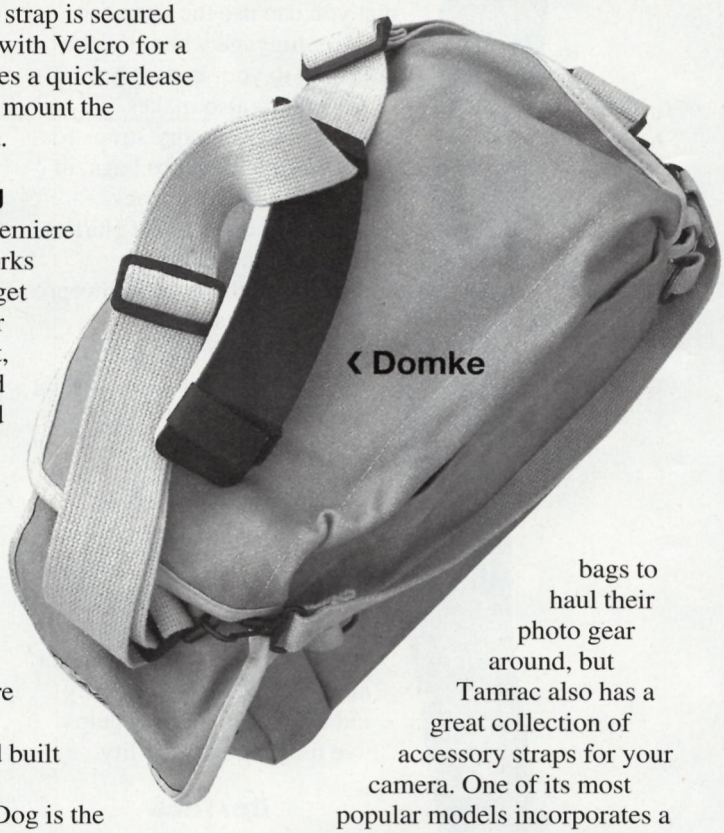
SunDog

The SunDog Premiere Shoulder Strap works great for your gadget bag. Contoured for maximum comfort, it's heavily padded at the shoulder and has a non-slip material to keep it from sliding. With its experience making bags for all sorts of adventures, SunDog's Premiere Shoulder Strap is rugged, sturdy and built for reliability.

Also from SunDog is the Action Harness, which works in conjunction with the SunDog Action Case (the Action Telezoom and Action Video) or River Runner (for compact video cameras and point-and-shoot cameras). The harness holds the case against your chest, keeping your camera or camcorder accessible and protected from bouncing around too much.

Tamrac

Professional photographers the world over rely on Tamrac gadget bags to haul their photo gear around, but Tamrac also has a great collection of accessory straps for your camera. One of its most popular models incorporates a leather pad where the strap hangs on your neck—it's very comfortable and durable. There are also foam-padded and sheepskin-padded models with the same general design.



‹ Domke

Both models have quick-release clips that allow you to detach the strap easily for tripod or other work where the strap might be in the way.

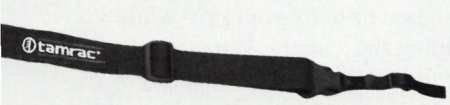
Tamrac also makes neoprene camera straps with and without quick-release clips, as well as a hand strap with quick-release clips. The X-Press Action Camera Harness hugs your camera to your chest where it won't bounce around during activity.

As for gadget bag straps, the Tamrac Bio-Curve Foam Padded Shoulder Strap will keep you comfortable thanks to its ergonomically padded shoulder curve. Steel swivel snap hooks and 5000-pound test aircraft seat belt webbing make the shoulder strap strong enough to carry any gadget bag.

The Tamrac Pro Series Camera Bag Harness has been designed for the large Pro Series Tamrac bags. By attaching the harness, you can carry the bag as a backpack. The harness is made with the same super-strong steel clips and seat belt webbing as the Bio-Curve strap and can be used with most large gadget bags that have standard "D" rings.

Visual Departures, Ltd.

Dewitt's Strap was designed by VDL, makers of the Flexfill reflectors, to keep up with the active photography style of *OUTDOOR PHOTOGRAPHER* columnist and *National Geographic* photographer, Dewitt Jones. You use Dewitt's Strap as a supplement to your regular camera strap. It wraps around your



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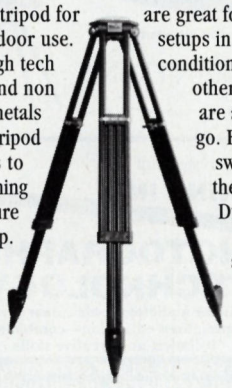

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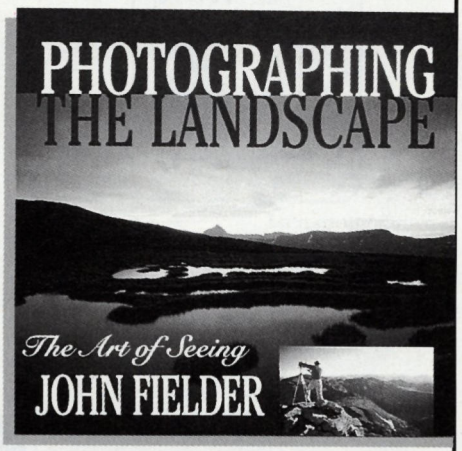

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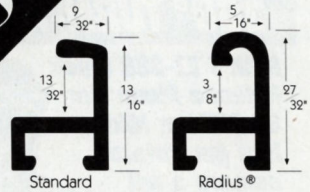

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body and attaches to the back of your camera with Velcro. As you run for the shot, the camera is held in place against your chest with no annoying and potentially damaging bouncing. Then, with a quick yank, the camera pulls free of the Velcro and you're ready to shoot.

Zero Halliburton

Fans of the distinctive Zero Halliburton cases will appreciate the Zero Halliburton carrying strap. The neoprene-padded, solidly constructed strap is made specially for the company by Op/Tech, and the Zero Halliburton logo is emblazoned on the shoulder pad. Although it has been designed for the excellent Zero Halliburton cases, the strap will work perfectly for any kind of case or gadget bag as long as it has rings to attach it. To keep the shoulder pad from slipping, the strap incorporates a textured surface made of tiny bumps in the shoulder area.

Zing Designs

Although Zing is primarily known for its protective neoprene covers and cases, it makes a nice wrist strap as well. The Zing SLR Action Strap is designed to relax your grip while holding the camera. When used with a standard neck strap for safety purposes, the Action Strap keeps

(Cont'd on page 101)

QUICK TIP

Camera straps are great for protecting your gear and carrying the camera. However, when you're shooting from a tripod, be careful of the friendly strap. If there's any wind, a camera strap left to dangle will blow around, causing shakes and vibrations galore.

If your strap has quick-release clips, you can make short work of removing it, ensuring sharp images. Otherwise, try wrapping it around the tripod's center column or just bunch it up and hold it in your hand.

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Robert Howard
Lebanon, PA

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"So, thanks, NYI, for giving me the training and confidence to turn my dream into reality. I couldn't have done it without you. And tell my instructor-by-mail that his constant encouragement helped make it happen!"

Karen Lorensen
Gallup, NM

"I never dreamed that during my NYI Course I would sell $200,000 in photos!"

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Louis Barton
Dallas, Texas

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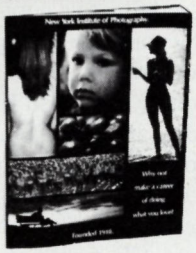

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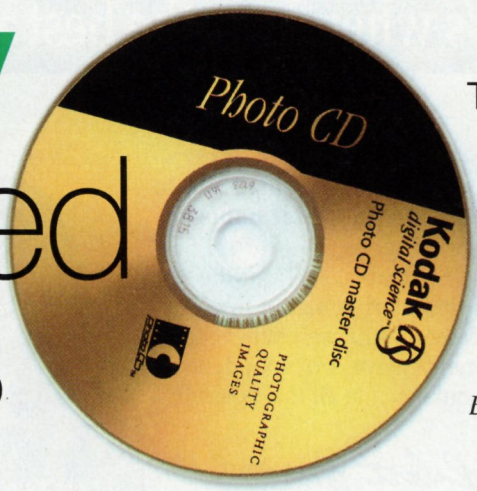


The cheapest, highest quality way of getting images onto a computer is with a Photo CD

By Joe Farace • Photography By Rob Sheppard

One of the easiest ways to digitize photographs is to have someone else do it for you. Having images digitized with lab processes like Kodak's Photo CD is probably the least expensive way to get started with image acquisition. You don't need to make much of an investment in additional computer hardware and you use the cameras and film you already have.

Photo CD does require a Photo CD-compatible CD-ROM drive, and the system is cross-platform. All of its products and software are compatible with Windows and Macintosh computers.

To get a Photo CD made, all you have to do is take your exposed, unprocessed film to a photofinisher who will turn your film images into digitized photographs. If you give them transparency film, you'll receive a box of slides along with a Photo CD containing all the images on the film. If you shoot negative film, you'll get a stack of prints along with the disc. Photo CD facilities can also digitize images from existing color slides and black-and-white or color negatives.

The Photo CD Master Disc format is designed for 35mm film, and each disc holds 100 high-resolution images. The discwriter writes five different file sizes (and five different resolutions), which Kodak calls Image Pac, onto the CD. Image resolution is stated as the number of vertical by horizontal pixels a photograph contains. On a Photo CD Master Disc, these are:

- **Base/16**—128 x 192 pixels
- **Base/4**—256 x 348 pixels
- **Base**—512 x 768 pixels
- **Base*4**—1024 x 1536 pixels
- **Base*16**—2048 x 3072 pixels

Why five different sizes? The small thumbnail sizes are used by digital image cataloging programs, and the base version is used for viewing on your monitor, television or Photo CD and CD-i players. Base*4 is for High Definition TV, and the highest resolution is for photographic-quality digital printing.

The Pro Photo CD Master Disc accepts images from 120 and 70mm rolls and 4x5 sheet film in addition to 35mm. The Pro disc includes optional copyright protection and an optional sixth Base*64 resolution image that yields a size of 4096 x 6144 pixels.

Kodak's Photo CD is my first choice for scanning images because of:

Compatibility: The same disc containing your photographs can be accessed by any Macintosh or Windows graphics program that recognizes the format.

Price: It typically costs $25 to digitize a 24-exposure roll of 35mm film. Whether you pay a buck an image or less, it's still much less expensive than purchasing a desktop scanner.

Flexibility: Kodak's Image Pac format contains five levels of resolution. If you have images digitized using Kodak's Pro disc, you also have the option of adding a sixth file size, with a resolution of 4096 x 6144 pixels. Having multiple resolutions on the same CD-ROM lets users work with a file size that fits the project and equipment they're working on and allows them to jam as many images on the disc as they want.

Quality: Kodak tells me that "the highest resolution level (4096 x 6144) Photo CD file captures all the image data 35mm film has to offer." Purists and pixel counters may dispute this, but my experience has been that when using the highest resolution files on both the Master and Pro Master discs, I can produce magazine-quality images and negatives that can print large, exhibition-quality prints.

OPPOSITE PAGE: The Photo CD allows nearly anyone with a computer and a CD-ROM drive to bring their photos into the computer. This scenic was taken with the Advanced Photo System, then put on a Photo CD. The image is from the Jeep Jamboree in the Black Hills near Deadwood, S.D.

Minolta Vectis S-1 Advanced Photo System camera, Vectis 28-56mm ƒ/4-5.6, Fujicolor Smart Film 100, Base*16 Photo CD Scan

Efficiency: Each Photo CD can hold 100 images. By comparison, if you have the same 100 images scanned to the same resolution as Kodak's Image Pac format, it would require 41 44 MB SyQuest cartridges or 18 Iomega Zip cartridges.

One of the joys of Photo CD is that you don't need a computer to see your digital images. Kodak offers a number of portable and desktop players that can be attached to your television set so that you can watch your photographs without turning on your computer. Kodak's new portable player, called the N2000, offers a 60-percent speed improvement over its predecessor and a newly designed remote control that can be tethered to the player or operated in wireless mode. The inexpensive N2000 is also a full-featured audio CD player.

Kodak has produced a series of programs that make working with Photo CD images easy and fun. At base level, you'll find Photo CD Access Plus for Windows and Macintosh computers. This package lets users open and display Photo CD images as well as crop, zoom and rotate them. You can save photographs in other file formats so they can be used with image enhancement programs that may not currently support the Photo CD format. There's even a low-cost version of Photo CD Access for DOS computers.

All versions of Adobe's Photoshop since 2.5.1 read Photo CD files directly through the program's Open function, but Kodak's Photo CD Acquire module lets you crop, color correct and sharpen an image while the file is being opened. You can also sharpen an image while importing it, saving you one step. This is important because it's the first thing most users do after opening a Photo CD. **OP**

• • •

The Digital Darkroom *by Joe Farace is published by Peachpit Press, (800) 283-9444 or http://www.peachpit.com/graphics.html.*

Kennan Ward: extreme photography

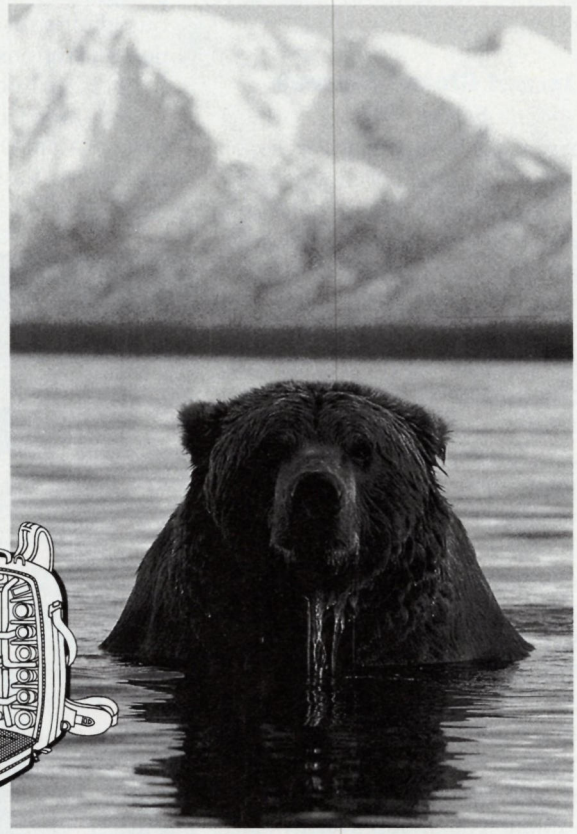
Kennan worked for years as a National Park Ranger in bear management in Alaska, Montana and California. He found this grizzly in Katmai National Park, Alaska.

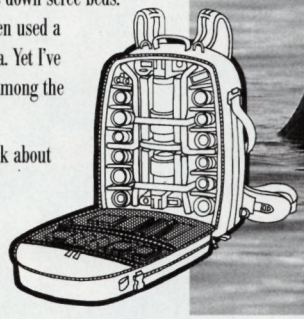
Kennan Ward's idea of challenging conditions is brutal: camping on an ice floe somewhere in the High Arctic, with temperatures in the minus forties, blowing snow, film cracking and batteries failing. Often, the only thing he can count on is his Lowepro camera bag.

He travels the world, from Africa to the Russian High Arctic. Despite the perils of tropical humidity, thunderstorms, snow and "phenomenally difficult" cold, his original 15-year old Lowepro Magnum is still going strong.

Kennan describes himself as a fond proponent of Lowepro camera bags. "I've got a collection now. I strap them to helicopters, wooden dogsleds, airplanes and llamas. I sit on them. I drop them. And I use them to protect myself – to break falls or tumbles down scree beds. It seems like every other day, I have an adventure with them. My wife even used a Lowepro Magnum to defend herself from an aggressive chimp in Tanzania. Yet I've never had equipment damaged in a Lowepro bag. The Lowepro bags are among the few things to survive many of my expeditions."

Relying on Lowepro is second nature for Kennan. "I don't even think about my camera bags any more. I know I can trust Lowepro."





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Kennan trusts the Photo Trekker AW (shown above, left) for its all-weather protection. The versatile modular design makes it easy to pack and adaptable in the field.

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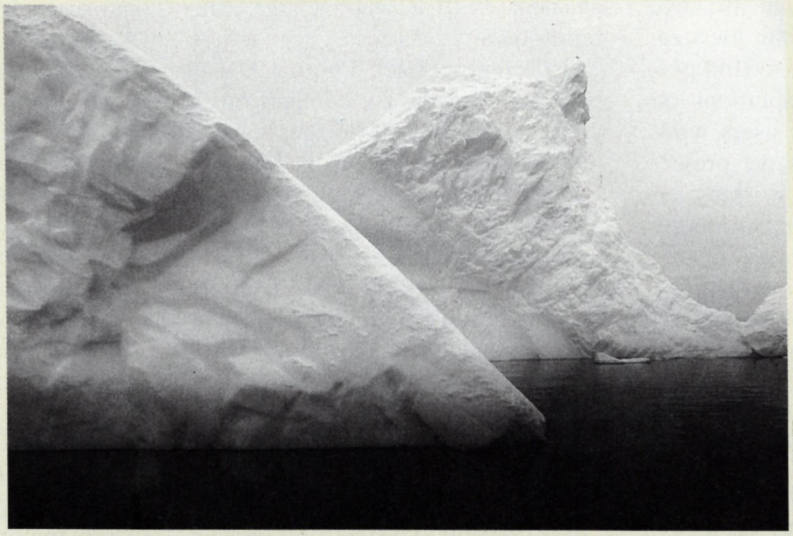

CHRIS RAINIER

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For more information, contact: Israel Photo Tours, 603 Murray Ln., Lafayette, CA 94549, (800) 878-5300, fax (510) 283-7484.

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Throughout 1997

Author, lecturer and *OP* columnist Lisl Dennis will lead three travel photography tours: "Morocco—Casablanca To Marrakesh" (May 3-17); "Provence—Footsteps Of Van Gogh" (May 24-June 7); and "India—Rajasthan And Pushkar Fair" (Nov. 5-23). Each tour will include numerous photo discussions, on-location demonstrations and ample free time for personal photography.

For more information, contact: Joseph Van Os Photo Safaris, P.O. Box 655A, Vashon Island, WA 98070, (206) 463-5383, fax (206) 463-5484.

LISL DENNIS

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Deadline: January 15

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For details, send a business-size SASE to: Photo Contest, P.O. Box 9916, Santa Fe, NM 87504.

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February-March, 1997

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For more information, contact: Natural Habitat Adventures, 2945 Center Green Ct., Ste. H, Boulder, CO 80301, (800) 543-8917, fax (303) 449-3712.

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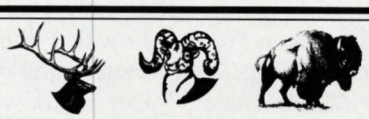

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For a complete schedule, contact: GAPW, 160 Whirlaway Trail, Corbin, KY 40701, (606) 523-1653, fax (606) 523-9112.

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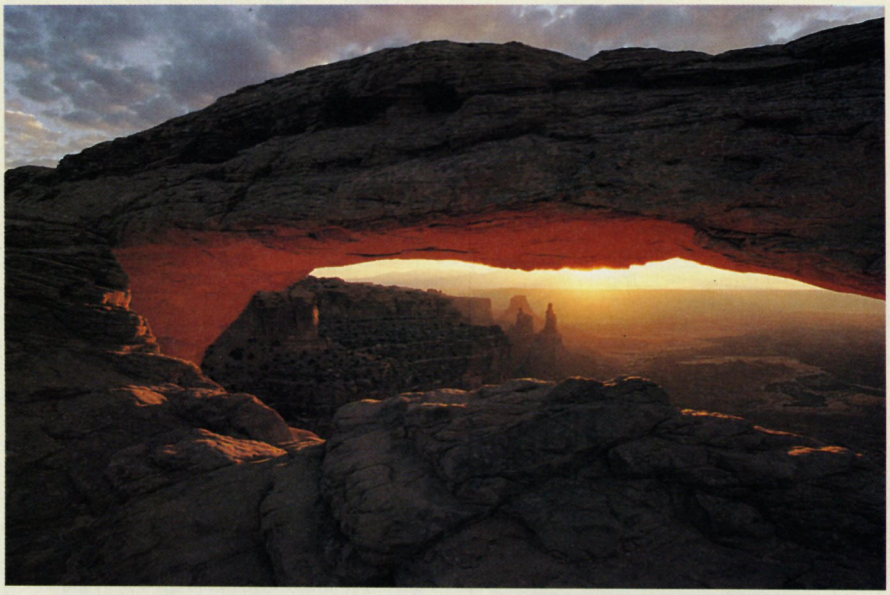
For more information, contact: RMSP, 210 N. Higgins, Ste. 101, Missoula, MT 59802, (800) 394-7677.



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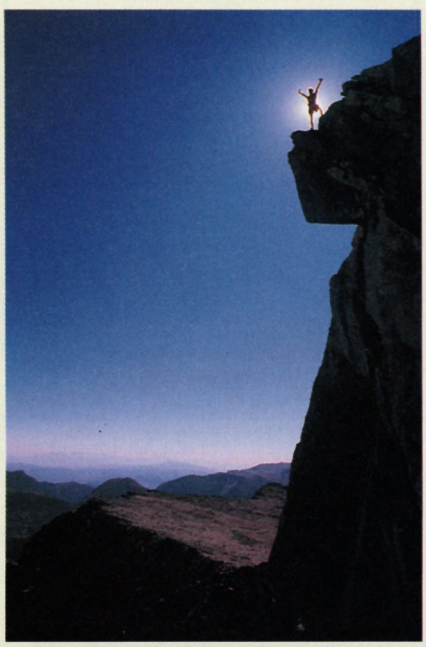

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Yosemite National Park & Mono Lake, CA	May 17 - 23
Western Colorado	June 7 - 13
Yellowstone & Tetons in Spring	June 14 - 20
Glacier National Park, MT	July 12 - 18
Canadian Rockies	July 19 - 27
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South Africa & Namibia Wildlife	Aug. 25 - Sept. 8
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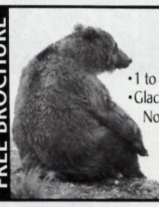

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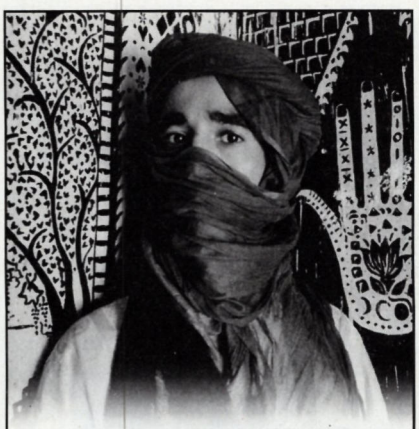

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363 Snowshoes For Snow Pictures
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(choose two)
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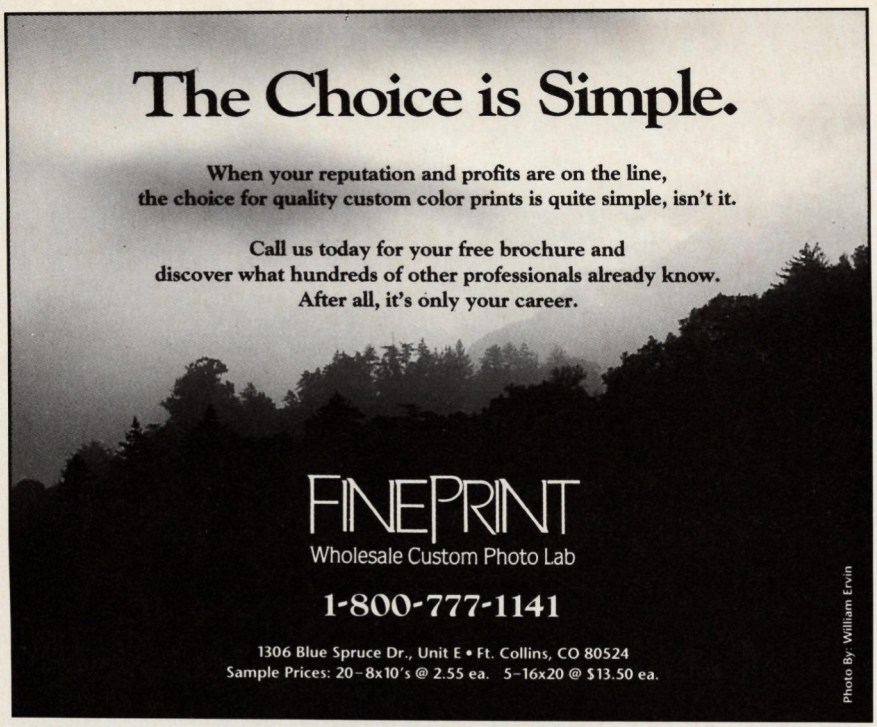

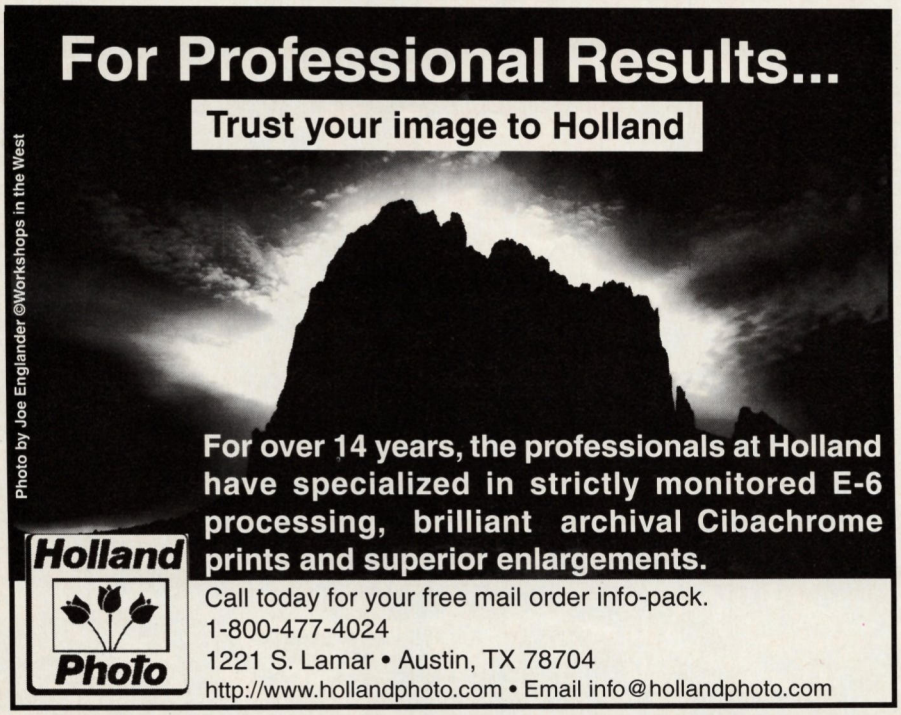

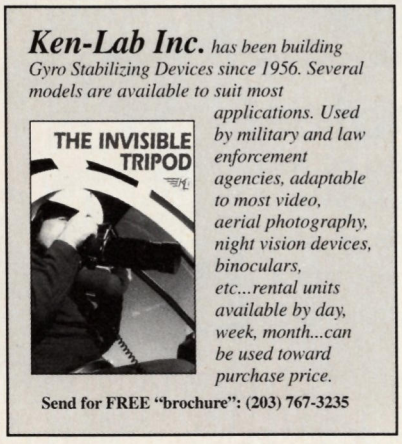

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FRAMING

(Cont'd from page 80)

didn't have to worry about focus. Canon has incorporated its latest Multi-BASIS technology in a three-zone autofocus system, with a cross-type sensor at the center, coupled with vertical line sensors to the left and right. The camera can choose these points or you can choose one by rotating the main dial.

After the first try at the soccer game, we checked our results and found that although the camera had performed beautifully, we hadn't. Traditional C framing had a decent number of good shots, H was okay, but P.... Well, we just missed a lot of shots. This long, thin frame is fascinating to work with—you really have to find something of interest from left to right (or top to bottom) or the composition won't work.

After more shooting, our percentage improved. One thing that's interesting about the P frame or format is that it's like using a wider-angle view for the width of the shot, but a telephoto for the depth. In the soccer game, that meant being able to eliminate big areas of empty grass so we could concentrate on the linear action. For a landscape, that might mean keeping the width of the scene, but getting rid of non-working foreground and sky.

We also did some shooting with the Sigma 70-300mm and Canon EF 24-85mm *f*/3.5-4.5 USM lens that's packaged with the EOS IX on some other subjects, including close-ups. Again, challenging ourselves to use all three framing formats when shooting close-ups made our compositions better.

The 24-85mm offers an excellent range of focal lengths (equivalent to approximately 30-105mm in 35mm terms) for the APS format. Constructed of 15 elements in 12 groups, the lens uses an aspherical element to minimize aberrations and distortions. We found it to be very sharp with excellent crispness and contrast, giving superb color rendition. (The lens will also fit a 35mm EOS body, offering the standard 24-85mm, and giving full coverage of the larger 35mm frame. We tried it out on a Canon EOS and were extremely pleased with the results. This lens isn't yet available for purchase separate from the EOS IX, but Canon will probably make a separate version available in 1997). **OP**

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GADGET BAG

(Cont'd from page 86)

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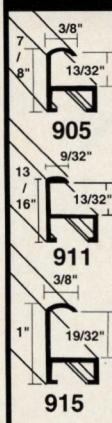

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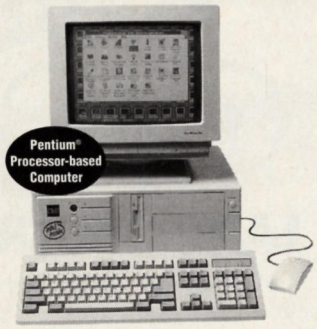

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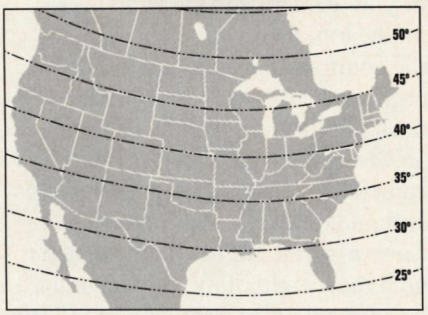

This chart will help you be in the right place at the right time by allowing you to plan your sunrise, sunset, moonrise and moonset photos ahead of time. You'll know exactly where to be with your camera for the photo composition you want to make long before the sun reaches the horizon. Find the nearest date at top and the latitude nearest your own in the column at left. Where the two intersect, you'll find the true (or map) bearings for rise (R) and set (S), rounded to the nearest degree. When using a compass to find the spot on the horizon where the sun or moon will rise or set, obtain the magnetic declination (variation) for your area from a USGS topographic map or other source. If the declination is east, subtract it from the bearing listed below to obtain the magnetic compass bearing. If the declination is west, add it. The result is the compass bearing to use in the field. *All data in Almanac is based on the comprehensive SUNTRACKER program, written by Charles Krebs, (206) 644-0077, fax (206) 644-1103.*

SUNRISE/SUNSET

Latitude	Jan. 4	Jan. 11	Jan. 18	Jan. 25
25° N	R-115	114	112	110
	S-245	246	248	250
30° N	R-116	115	113	111
	S-244	245	247	249
35° N	R-117	116	115	113
	S-243	244	246	248
40° N	R-119	118	116	114
	S-241	242	244	246
45° N	R-122	121	119	116
	S-238	240	242	244
50° N	R-126	124	122	119
	S-235	236	238	241
55° N	R-131	129	126	123
	S-230	232	234	237
60° N	R-138	136	132	128
	S-222	225	228	232
65° N	R-152	148	143	137
	S-208	213	218	223
70° N	R- --	--	--	155
	S- --	--	--	206

FULL MOONRISE/MOONSET

Latitude	Jan. 21	Jan. 22	Jan. 23	Jan. 24
25° N	R-070	072	074	077
	S-290	289	287	284
30° N	R-069	071	073	077
	S-291	290	288	285
35° N	R-068	070	072	076
	S-292	291	289	286
40° N	R-066	068	071	075
	S-294	293	290	287
45° N	R-064	066	070	074
	S-296	295	292	288
50° N	R-062	064	067	072
	S-299	297	294	290
55° N	R-058	060	064	070
	S-303	301	297	293
60° N	R-052	055	060	066
	S-308	306	302	296
65° N	R-044	048	054	062
	S-317	314	308	301
70° N	R-026	033	043	054
	S-335	328	319	309

MOON PHASES

◐	Last Quarter	Jan. 1
●	New	Jan. 8
◑	First Quarter	Jan. 15
○	Full	Jan. 23
◐	Last Quarter	Jan. 31

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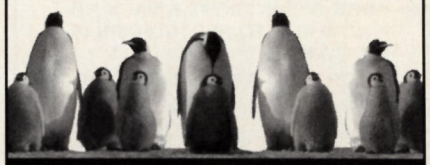

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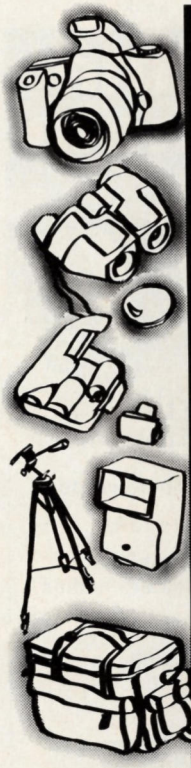

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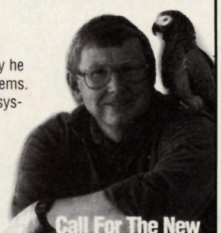

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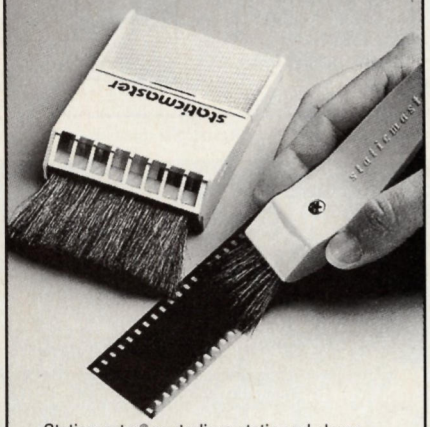

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(Cont'd from page 19)

ing scents available from sporting-goods stores that specialize in hunting. You might look at mail-order outdoor supply companies like Cabela's, (800) 237-4444. Human scent, even without insect repellents, will be enough to send sensitive wild animals fleeing if you're upwind of them. Be sure to check the wind and your stalking techniques.

Shooting in low light, especially after the sun has gone down, requires a sturdy tripod, fast films and a cooperative subject. You mentioned a 1/125 sec. shutter speed and an *f*-stop of *f*/5.6 with ISO 1000 film. The lens opening can't be changed because that's all you've got. The film speed is at about the maximum unless you go to ISO 1600, but image quality will suffer.

Shooting in low light, especially after the sun has gone down, requires a sturdy tripod, fast films and a cooperative subject.

This means that your shutter speeds are the only control left. I'd guess that a shutter speed down to 1/30 sec. might be necessary to photograph these late-evening subjects. Try to capture them as they freeze, attempting to get your scent. Now you can see how important that tripod can be.

One other solution may be Canon's new EF 75-300mm *f*/4-5.6 Image Stabilizer lens. I can get reasonable percentages of sharp images at 1/15 sec. with the lens zoomed to 300mm.

A problem with these late images is a lack of contrast or color. In a few cases, the effect is interesting. Often, we need to realize that the photo moment is past and just enjoy the scene with the latent image in our brain. At the very least, thank nature photography for bringing you to the place and the memories. **OP**

If you have any tips or questions, address them to: OUTDOOR PHOTOGRAPHER, Dept TT, George Lepp, 12121 Wilshire Blvd., Suite 1200, Los Angeles, CA 90025-1175.

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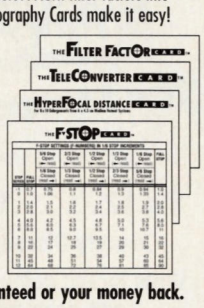

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SNOWSHOES

(Cont'd from page 63)

aircraft aluminum tubing in a variety of colors gives the snowshoe its shape and strength, while a solid Hypalon decking offers maximum flotation. Stainless-steel talons add traction to the units. They come in a variety of designs and sizes for everyone, from kids to large adults.

Atlas Snowshoes (81 Lafayette St., San Francisco, CA 94109, (800) 645-SHOE) makes a range of lightweight, aluminum framed snowshoes with Hypalon decking designed specifically for walking, hiking or running. A spring-loaded binding lifts the nose of the snowshoe on every step, while molded footbeds, telemark heel pads and heel and toe cleats help you snowshoe in even more demanding conditions.

Tubbs Snowshoes (P.O. Box 207, Stowe, VT 05672, (802) 253-7398) is one of the oldest snowshoe makers around, and it still offers traditional wood-framed snowshoes as well as modern-generation aluminum frame models. Tubbs snowshoe designs are known for their control and stability in mountainous, brushy or rocky terrain and come in a variety of sizes to fit different needs. Tubbs also makes aluminum frame models for L.L. Bean (Freeport, ME 04033, (800) 809-7057).

Yubashoes (1157 W. Sunset Blvd., Rocklin, CA 95765, (800) 598-YUBA) offers a design that it claims is like the natural shape of your foot for a more comfortable stride. They feature front and rear cleats, nylon molded step-in bindings and a rigid pivot system.

Romp Snowshoes (111 S. Robinson, Florence, CO 81226, (719) 784-3292) offers both aluminum-frame and injection-molded snowshoes called Boonies. Boonies are available in multiple colors and in two special versions for children. Romp Snowshoes offer a choice of frame colors and include aluminum claws for traction.

Snowshoes are available in a variety of sizes, shapes and colors because we as photographers come in a variety of sizes and shapes, so our needs and preferences are different. Write or call for information from these manufacturers to see how they meet your specific needs and check out the models available at an outdoor supply or sporting-goods store near you. **OP**

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KE	(100)	3.85	6.55	3.85	7.54	—
E100, S, SW	(100)	—	—	7.99	11.99	—
ET	(160)	4.85	7.65	5.99	9.59	—
ED	(200)	4.85	7.75	6.99	9.89	—
KL	(200)	4.18	8.18	6.95	10.38	—
EL	(400)	5.35	9.35	7.45	10.38	—
PKM	(25)	—	6.54	10.10	—	—
PKR	(64)	—	6.29	9.89	—	—
EPY	(64)	3.45	—	5.39	9.20	66.89
EPR	(64)	2.90	—	5.24	9.05	69.95
EPN	(64)	—	—	5.44	9.55	—
PKR	(64)	—	—	4.44	9.95	85.89
VR	—	—	—	6.99	10.99	—
ER	(100)	4.49	7.09	5.29	8.99	—
LLP	(100)	—	—	6.74	11.49	94.50
LP2	(100)	—	—	6.69	11.49	—
LPP	(100)	3.25	6.15	4.95	9.85	79.95
EPP	(100)	3.85	—	6.25	9.85	72.95
EP2	(100)	—	—	6.34	10.40	—
EPT	(160)	—	—	6.79	10.79	—
EPD	(200)	—	—	6.95	10.55	73.89
EPJ	(200)	—	—	7.95	11.55	—
EPH	(400)	6.19	9.79	7.99	8.99	—
EES	(1600)	—	—	8.35	11.95	—
HC5	—	—	—	10.24	—	—
5071	(DUP)	—	—	4.95	8.50	38.95
HCS	(EKTA)	—	—	4.15	7.77	—

	ASA	120	220		ASA	120	220
EPP	(64)	3.25	—	EPR	(64)	3.23	7.28
EPX	(64)	3.43	—	PKR	(64)	4.15	—
EPN	(160)	3.25	7.70	EPP	(100)	3.25	7.74
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RA	100	3.49	5.59	4.60	12.49	—
RC	400	4.49	10.78	5.49	13.99	—
RF	1000	5.19	11.25	6.69	14.99	—
Ektar	1000	3.44	9.90	5.35	13.25	—
GA	100	3.44	7.90	4.44	10.45	—
GB	200	2.39	8.35	2.94	11.05	—
GC	400	2.54	8.50	3.48	11.25	—
GE	800	4.50	10.90	5.99	13.90	—
PHR	25	—	—	5.29	13.05	—
VPS	160	3.25	8.90	3.94	11.75	42.85
VPH	400	—	—	5.44	13.40	42.39
PPA	100	—	—	2.29	10.50	—
PJZ	400	—	—	3.44	12.50	—
PJB	400	—	—	3.80	11.50	—
PJC	1600	—	—	5.04	12.80	—

	ASA	120	220		ASA	120	220
PHR	25	3.39	—	GA	100	2.10	—
VP	120	1.99	—	VPS	160	2.60	5.25
VHC	160	2.75	—	VPH	160	2.75	—
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KODAK B&W

ASA	24	24w/p	36	36w/p	100ft
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TX	400	2.02	7.98	2.54	10.70	28.80
TMY	400	2.14	8.09	2.84	10.80	28.80
TMZ	400	2.21	3.09	3.05	10.90	28.80
HC5	—	—	4.69	8.99	—	—
5071	(DUP)	—	—	4.95	8.50	38.95
HCS	(EKTA)	—	—	4.15	7.77	—

	ASA	120	220		ASA	120	220
PXP	125	2.24	7.70	TXP	320	—	24.95
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ASA	24	36	36w/p	120	220
SR100	1.59	1.99	10.19	2.49	—
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SR400	2.25	3.75	12.19	3.39	—
SRG160	3.09	4.34	12.14	3.25	5.29
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R100	3.99	5.49	8.99	—	—

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ASA	24	35	120	220pp	100ft
FP-4125	1.93	2.49	2.29	25.50	28.50
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HP5 400	1.87	2.54	1.89	25.90	29.90
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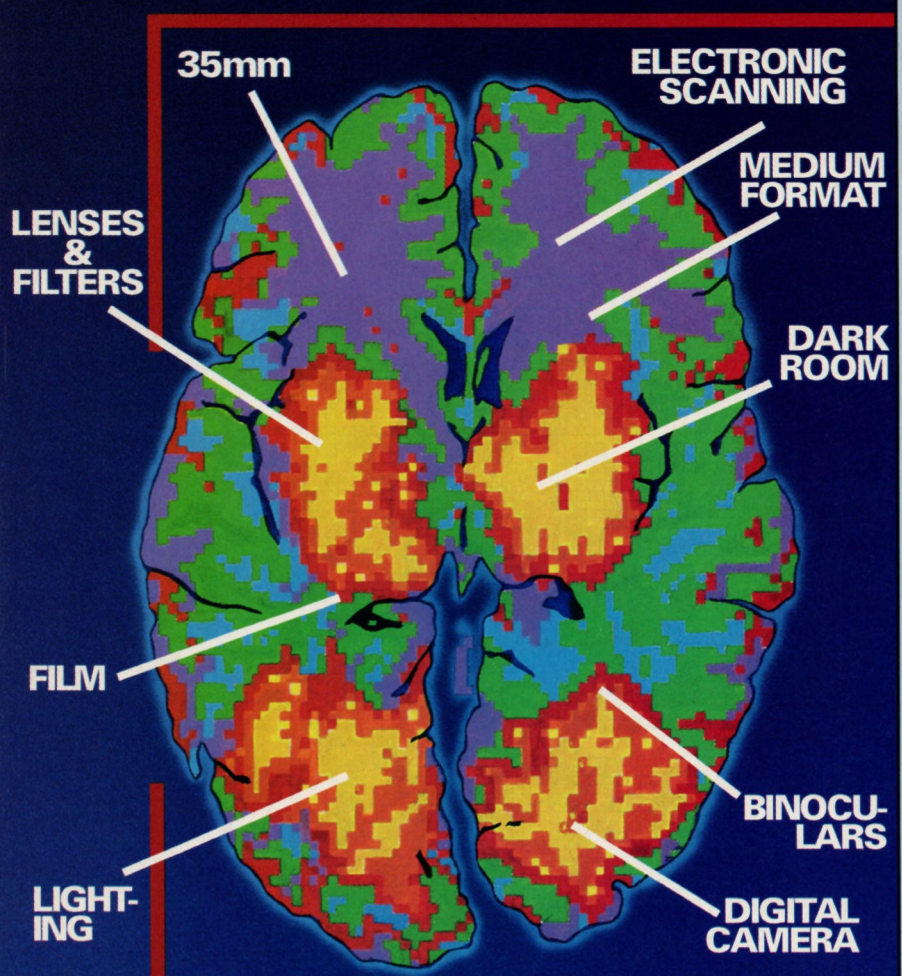

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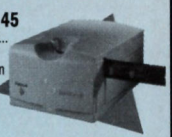

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PMC	400	---	5.48	14.09	26.99	3.39
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PX	125	2.57	8.89	3.69	12.38	---
PXP	125	---	---	---	---	2.55
TXP	320	---	---	---	---	2.65
TX	400	2.69	8.99	3.69	12.39	2.39
TMY	400	2.88	8.99	3.99	12.69	2.69
TMZ	3200	---	---	4.69	13.09	---

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PKR	64	7.35	11.69	4.60	---	---
EPN	100	7.87	12.24	4.34	44.45	84.99
E100S	100	7.99	12.38	4.43	---	---
E100SW	100	7.99	12.38	4.43	---	---
EPP	100	7.87	12.24	4.29	43.55	74.99
EPT	160	8.55	12.94	4.60	---	79.99
EPD	200	8.60	12.99	4.60	47.05	59.99
PKL	200	8.95	13.39	---	NO GRAY KODAK PROFESSIONAL FILM!	

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KR USA	64	4.09	7.48	5.49	10.22
ELITE EA	50	4.55	7.94	6.38	10.77
ELITE EB	100	3.84	7.24	3.85	10.24
ET	160	5.49	8.88	6.99	11.24
ELITE ED	200	4.99	8.33	5.49	9.88
KL USA	200	4.99	8.38	7.39	11.78
ELITE EL	400	5.99	9.18	6.74	11.24

COLOR PRINT FILM 35mm

	ASA	135-24	135-36	w/Proc.
GA	100	1.99	2.39	10.99
GB	200	2.29	2.69	11.49
GC	400	2.39	2.99	11.74
ROYAL GOLD RZ USA	25	4.08	4.69	13.39
ROYAL GOLD RA USA	100	3.55	4.45	13.19
ROYAL GOLD RB USA	200	4.15	5.22	13.99
ROYAL GOLD RC USA	400	4.55	5.39	14.18
ROYAL GOLD RF USA	1000	5.19	6.59	15.34

FUJIFILM

COLOR PRINT FILM 35MM

	ASA	36 Exp.	W/Proc.	120	220	100'
CN	100	1.91	10.79	2.19	---	---
SUPER G	100	2.99	11.75	---	---	---
CA	200	2.49	11.09	---	---	---
SUPER G	200	3.49	12.19	---	---	---
CH	400	3.29	---	CALL	---	---
SUPER G	400	4.39	13.78	---	---	---
SUPER G CZ	800	4.79	13.78	---	---	---
CU	1600	4.99	14.09	---	---	---
CS REALA		3.29	11.99	2.59	3.99	---

PRO COLOR PRINT FILM

NEW! NPS	160	3.99	11.58	2.69	6.05	---
NEW! NPL	160	---	---	3.09	---	---
NEW! NPH	400	3.99	14.59	3.29	6.89	---
NHG	400	4.99	13.19	3.49	6.99	---
NEW! CDU	DUPE	---	---	---	---	39.50
ITN		---	---	---	---	70.50

SENSIA SLIDE FILM

	ASA	135-24	W/KP	135-36	W/FP	100'	120	220
RD	100	2.89	6.28	SPECIAL		---	---	---
RM	200	3.39	7.08	4.59	8.08	---	---	---
RH	400	5.49	8.88	5.78	9.27	---	---	---

PROFESSIONAL SLIDE FILM

VELVIA RVP	50	---	---	5.99	9.48	83.95	3.60	8.19
PROVIA RDP	100	---	---	5.99	9.49	78.90	3.89	8.19
PROVIA RHP	400	---	---	6.99	11.35	103.50	4.95	---
PROVIA RSP	1600	---	---	9.35	---	---	---	---

35MM SLRS

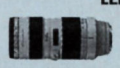
Canon

NEWS FLASH! CANON REBATES EXPIRE 12/31/96

BODIES/KITS

EOS 1N	($100 Rebate) 1,669.	Rebel X BODY	179.
EOS 1N RS	($100 Rebate) 2,499.	Rebel X Kit w/35-80	284.
EOS A2 Kit w/28-105 USM	($100) 999.	NEW! Z135 Zoom	269.
EOS ELAN II BODY	399.	A1 Underwater	165.
Elan II Kit w/28-80 USM	CALL		
Rebel "G" Body	249.		
Rebel "G" Kit w/35-80	364.		
EOS A2	($75 Rebate) 669.		
EOS A2E	($75 Rebate) 769.		
EOS A2E Kit w/28-105 USM	($100) 1,099.		
EOS ELAN IIE Body	449.		
Elan II E Kit w/28-80 USM	CALL		

LENSES/FLASHES



50/1.4 USM	359.	400 5.6L USM	1,469.
15/2.8 EF	CALL	20/2.8 USM	499.
24/2.8 EF	358.	28/2.8 USM	208.
NEW! 28/1.8 EF USM	495.	35/2.0	297.
50/1.8 EF II	CALL	85/1.2 L USM	1,879.
85/1.8 EF USM	372.	NEW!180/3.5 Macro USM	1,629.
NEW! 135/2.0 USM	1,049.	200/2.8 USM	714.
200/1.8 L EF USM	4,499.	28-80 USM	189.
20-35 USM	449.	35-80 USM	159.
35-80 EF III	89.	100-300 USM	($25 Rebate) 323.
17-35/2.8L	1,629.	28-105 USM	($25 Rebate) 328.
28-70/2.8 L	($75 Rebate) 1,439.	70-200/2.8L	($75 Rebate) 1,539.
35-350 USM	1,999.	75-300 IS USM	($25 Rebate)
75-300 USM	249.	300/4 OL USM	($75 Rebate) 1,089.
300/2.8 L USM	4,599.	400/2.8 L II	7,549.
		540 EZ	334.
		480 EG	509.
		380 EX Flash	CALL
		ML-3 Ring Light	CALL

PENTAX

NEW REBATES! CALL!

BODY

PZ-1P	$100 Rebate	NEW! ZX-10	CALL
PZ-70	$30 Rebate	ZX-5	399.

POINT & SHOOT

UC-1 QD	SPECIAL	IQ Zm 928	$20 Rebate
IQ 90WR	$20 Rebate	IQ Zm 115m	219.
IQ Zm 140	$20 Rebate	IQ Zm 160	$30 Rebate

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Nikon

NEW REBATES – CALL UP TO $100 ON SELECT LENSES

WITH USA WARRANTY

N90S	CALL	N70	499.
N70QD	CALL	N6006QD	CALL
N50	$35 Rebate	N6006	349.
FM-2	CALL	NEW! F5	CALL
F3HP /F4S	CALL		

LENSES USA – NOT GREY!!!

24/2.8D	(-$35)	28/2.8D	(-$25)
35/2.0d	(-$35)	60/2.8D	439.
50/1.4D	273.	50/1.8	CALL
85/1.4D	CALL	85/1.8D	381.
105/2.8D	689.	20-35/2.8D	CALL
35-70/2.8D	CALL	24-50/3.3-4.5D	(-$50)
28-70/3.5-4.5D	(-$50)	80/3.5-5.6D	(-$35)
28-85/3.5-4.5	(-$50)	35-80/4-5.6D	(-$15)
135/3.5-4.5	(-$50)	80-200/4.5-5.6D	(-$35)
35-105 D NEW		75-300/4.5-5.6	
80-200/2.8D	CALL	300/2.8D	IN STOCK
400/2.8D	CALL	SB-26 Flash	CALL
SB-27 Flash	CALL	CALL FOR ALL ACCESSORIES	

MINOLTA

700si	559.	Wthrmtc Dual	CALL	24-85 AF	418.95
400si	245.	AF 101R Kit	57.	28-80 AF	174.
400si KIT 1	345.	MANUAL CAMERAS		28-85 AF	312.
300SI KIT 1	309.	X-700 Body	239.	28-105 AF	334.
600si	389.	X-370 Body	179.	70-210 AF	134.
300si	235.	AF LENSES & FLASHES		75-300 AF	259.
FZ Explorer	179.	20/2.8 AF	CALL	100-300 AF	319.
FZ 140 EX	289.	24/2.8 AF	CALL	100-400 Apo AF 3500Xi	157.
105 EX Kit	189.	50/1.7 AF	77.95	5400 HS	CALL
Action Zoom	99.	50/1.4 AF	245.	Accessories	CALL

YASHICA

Dental Eye II	CALL
T4-Super	148.

UNDERWATER

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LENSES

TAMRON

UP TO $20 IN REBATES

6 YEAR USA WARRANTY!	MANUAL	MAXXUM	EOS	NIKON AF	PENTAX
90/2.5 Macro	279.	---	---	---	---
NEW! 90/2.8 macro	---	439.	439.	439.	---
300/2.8 LD	2169.	---	---	2649.	---
500/8	369.	---	---	---	---
20-40/2.7-3.6	---	674.	674.	674-D	---
24-70/3.3-5.6	---	239.	239.	239.	---
28-70/3.5-4.5	159.	136.	---	136.	---
NEW! 28-80/3.5-5.6	---	129.	129.	129-D	---
28-200/3.8-5.6	299.	299.	299.	299.	299.
NEW! 28-200/3.8-56 IF SUPER	329.	329.	329.	---	---
35-135/3.5-4.5 Macro	299.	---	---	---	---
60-300/3.8-5.4 Macro w/hood	349.	---	---	---	---
70-210/4-5.6 (3")	159.	139.	---	139.	---
70-210/2.8 LD	---	948.	948.	948.	---
NEW! 70-300/4.0-5.6 DL	---	269.	269.	269.	---
80-210 4.5-5.6	---	149.	149.	149-D	---
NEW! 200-400/5.6 AF*	---	579.	579.	579-D	---
2X Flat-field Converter	139.	139.	139.	139.	---
1.4x Converter SP	---	109.	109.	109.	---

** Buy a Tamron 200-400 Lens & Receive An Action Monopod from Tamron, FREE!*

Tokina

5 YEAR USA WARRANTY!

	MANUAL	MAX	EOS	NIKON
17/3.5 ATX AF	229.95	369.95	369.95	369.95
400/5.6 ATX APO	---	439.95	439.95	439.95
28-70/2.6-2.8 ATX PRO	---	499.95	499.95	499.95
80-200/2.8 ATX PRO	---	789.95	789.95	789.95
100-300/4 ATX APOII	---	789.95	789.95	789.95
NEW! 80-400 4.5-5.6 ATX PRO	---	699.95	699.95	699.95

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35MM SLR CAMERAS, LENSES & ACCESSORIES

CANON

T-90 Body ...999.95 T-50 Body ...179.95
NPC Polaroid Back for T-90 ...729.95
Diopter Lens..16.95 Case For T-90 ..69.95
Focusing Screen for T-90 ...49.95
Remote Switch 60 T-3 ...34.95
Extension Cord 1000 T-3 ...34.95
Cable Release Adapter T-3 ...29.95
Remote Switch Adapter T-3 ...24.50
Data Memory Back 90 ...299.95

AE-1 Used ...149.95 T-90 Used ...599.95
AE-1P Used ...199.95 A-1 Used ...219.95
T-60 Used ...149.95 T-70 Used ...219.95
Cases for above Cameras ...39.95

FD LENSES

7.5/6.6 ...1299.95 135/3.5 ...64.95
15/2.8 ...1099.95 135/2.0 ...599.95
17/4 ...569.95 135/2.8 ...159.95
20/2.8 ...599.95 200/2.8 ...649.95
24/2.8 ...319.95 300/4.0 ...374.95
24/2.0 ...609.95 500/8 ...399.95
28/2.8 ...199.95 600/4.5 ...2499.95
28/2.0 ...499.95 35-70/3.5 ...199.95
35/2.8 ...79.95 75-200/4.5 ...199.95
35/2.0 ...399.95 100/2.8 ...199.95
50/2.8 T.S ...1299.95 100-200 F5.6 ...109.95
50/1.4 ...99.95 70-210 F4 ...329.95
50/1.8 ...59.95 1.4X ...299.95
2XA ...209.95 2XB ...319.95
50/3.5 Macro w/FD25 Tube ...359.95
100 F4 Macro w/ FD50 Tube ...649.95
Lens Guide Book Lens Work ...18.50
Vivitar 35-70 F3.5 for Canon ...79.95

FD "L" LENSES

14/2.8 L ...2399.95 300/4 L ...1349.95
24/1.4 L ...1399.95 400/2.8 L ...4999.95
50/1.2 L ...899.95 500/4.5 L ...3699.95
20-35/3.5L ...1089.95 800/5.6 L ...3199.95
85/1.2 L ...969.95 80-200 F4 L ...699.95
300/2.8 L ...3099.95 200/1.8 L ...3399.95

FLASHES & ACCESSORIES

480 EG ...499.95 Slave Unit E ...39.95
540 EZ ...334.00 300 EZ ...134.95
430 EZ ...249.95 200 E ...49.95
420 EZ ...189.95 220 EZ ...129.95
380 EX ...159.95 244 T ...99.95
540 EZ w/Battery Pack E ...349.95
Ikelite Wireless TTL Slave Sensor ...119.95
Achiever 260AF f/EOS ...89.95
Achiever 630AF f/EOS ...119.95
Compact Battery Pack E ...39.95
Transistor Pack E ...119.95
Transistor Pack E w/Nicad ...239.95
Off Camera Shoe Cord (2 Ft.) ...39.95
TTL Hot Shoe Adapter 3 ...59.95
Off Camera Shoe 28.95 TTL Distributor ..44.95
Connecting Cord 01 (2 long) ...34.95
Connecting Cord 300 (9.8 ft long) ...39.95
ML-3 Macro Ring Light ...189.95
72mm Adapter For ML-3 ...29.95
Battery Pack MA ...149.95
Nicad Battery Pack MA ...84.95
TM-1 Timer ...134.95 LC-3 Set ...69.95
LC-1 Set ...179.95 LC-2 Set ...129.95
External Battery Pack A Set ...84.95
Focusing Screen /AE-1P ...29.50
Data Back A ...269.95 Synchro Cord-A ..9.95
Winder A-2 ...139.95 Winder-A ...119.95

CANON MACRO SYSTEM & ACCESS

Book for Macro System ...17.95
Extension Tube FD 15 ...69.95
FD 25 Tube ...64.95 FD 50 Tube ...69.95
Reverse Ring for Canon ...19.95
Photo Micro Unit F ...49.95
Auto Bellows w/Cable Release ...229.95
Slide Duplicator 35-52R Kit ...124.95
Focus Rail ...109.95 G-20 Sensor ...49.95
Macrophoto 20/3.5 Lens ...164.95
Macrophoto 35/2.8 Lens ...189.95
Copy Stand 5 ...499.95
Angle Finder A-2 w/Adapter S ...59.95
Angle Finder B w/Adapter S ...84.50
Angle Finder Adapter for A2/A2E ...19.95
Magnifier R or S ...34.95
Hasselblad Lens to Canon FD ...119.95
C Mount Adapter for Canon ...28.80

CONTAX

G1 AF RANGE FINDER

G-1 Body Less $250 Rebate ...999.95
16/80 ...2650.00 28/2.8 ...520.95
21/2.8 ...Call 35/2 ...Call
45/20 ...339.00 90/2.8 ...520.95
TLA-140 Flash ...149.95 GD-1 Date Back 129.95

$400.00 REBATE
Buy G1 Body, 3 Lenses + Flash

NEW! G2 ...Call

*UP TO $225 REBATE

*167 MT ...464.00 *RTS III ...2064.95
S-2 ...1049.00 S-1 ...1429.00
*RX Body ...1094.00 AX Body ...2099.95
Contax Camera Case 159 ...29.95
Case to fit w/Data Back ...59.95

ZEISS LENSES

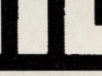
60/2.8 Mac ...779.95 Mutar 2X ...399.95
15/3.5 ...3999.95 139 Winder ...84.95
16/2.8 ...2549.95 RTF 540 ...299.95
100/2.8 Mac ...1499.95 D-7 Date ...259.95
200/4 ...529.95 D-4, D-5 ...199.95
250 Back ...549.00 P-7 Holder ...119.95
35/2.8 PC ...2439.95 P-5/P-6/P-8 ...59.95
Hasselblad Lens to Contax ...109.95
Quartz Data Back for 139 Q ...74.95

ZEISS LENSES MM-MOUNT

18/4 ...Call 21/2.8 ...Call
25/2.8 ...Call 28/2 ...Call
35/1.4 ...Call 35/2.8 ...Call
45/2.8 ...Call 50/1.7 ...Call
50/1.4 ...Call 85/1.4 ...Call
100/2 ...Call 135/2 ...Call
135/2.8 ...Call 180/2.8 ...Call
200/4 ...Call 200/2 ...Call
300/4 ...Call 35-135 ...Call
60/2.8 ...Call 300/2.8 ...Call
35-70 ...Call 28-85 ...Call
80-200 ...Call 100-300 ...Call
Soft-Hood ...18.50 Metal- Hood ...24.95
Adapter Ring ...24.95 Body Cap ...6.95

CANON

NEW! APS



EOS IX

Call For Price

	Reg. Price	Canon Rebate	Final Cost
EOS-1 N	1669.00	100.00	1569.00
EOS-1 N RS	2499.00	100.00	2399.00
A-2 Body	869.00	75.00	794.00
A-2E Body	769.00	75.00	694.00
A-2 w 28-105 Kit	999.00	100.00	899.00
A-2E w 28/105 Kit	1099.00	100.00	999.00
*EOS-1 Body	999.95	Cmmnd Back E-1	185.95

Battery Pack BP-E1 ...119.95
Power Drive Booster f/EOS-1 ...199.95*
Hand Strap E-1 24.50 Nicad Pack E-1 ...86.95
Nicad Charger E-1 ...229.95
EOS-1 Book Art of the Image ...24.95
Focusing Screen f/EOS-1 ...29.95
EC-R/EC-K Laser-Matte Screen ...54.95
VG-10 Grip with purchase of A-2/A-2E ...39.95
*With Purchase of EOS-1

EOS CAMERA'S

EOS-10s ...629.95 EOS-5 ...599.95
Rebel XS QD ...269.95 Elan II ...389.95
Elan II E ...439.95 Elan II E QD ...449.95
Rebel X ...199.95 Rebel XS ...234.95
New Rebel G ...242.95 Rebel G QD ...284.95
Rebel G w/35-80/4.0 Kit ...189.95
EOS Rebel II ...189.95 EOS RT ...469.95
Rebel X w/35-80 4.0 Kit ...284.95
Rebel XS w/35-80/4.0 Kit ...334.95
EOS 5000 w/35-70 Kit ...249.95
EOS ELAN Kit w/28-80 USM ...529.95
ELAN IIE Kit w/28-80 USM ...599.95
Eyepiece Extender for EOS Cameras ...18.50
CANON EOS Case S,L,Ll ...44.95
4 Year Extended Warranty ...34.00

EF LENSES

15/2.8 ...679.95 28-80/3.5.5.6 ...139.95
24/2.8 ...349.95 50/1.8 ...64.95
28/2.8 ...189.95 100/2.8 Macro ..569.95
35/2.0 ...279.95 80-200 F4.5 ...134.95
50F2.5 Mac ...289.95 75-300 F4.0 ...179.95
1:1 Life Size ...199.95 75-E 24/3.5 ..1369.00
135/2.8SF ...349.95 75-E 45/2.8 ..1369.00
35-80/4 III ...84.50 75-E 90/2.8 ..1269.95

EF "U.S.M." LENSES

	Reg. Price	Canon Rebate	Final Cost
28-70/2.8L	1439.00	75.00	1369.00
70-200/2.8L	1539.00	75.00	1464.00
75-300/4.I.S.	519.95	25.00	494.95
75-105/3.5	314.00	25.00	289.00
35-135/4	289.00	25.00	264.00
100-300/4.5	314.00	25.00	289.00
20 F2.8	469.95	20-35/3.5	449.95
28/1.8	479.95	85/1.8	359.95
50/1.4	349.95	100 F2.0	444.95
35-80 F4	299.95	70-300/4.0	229.95
24-85/3.5	399.95	80-200/4.5	179.95
35-135	264.95	70-210/3.5	239.95
28.80/3.5 II	164.95	EF-12 Ext. Tube	59.95
28-80/3.5 IV	189.95	EF-25 Ext. Tube	99.95

EF "L" LENSES

14/2.8 L ...2319.00 50/1.0 L ...2399.95
17-35/2.8L ...1629.00 28-80/2.8L ...999.95
85/1.2 L ...1049.95 20-35/2.8 ...1449.95
135/2. L ...1019.00 35-350/3.5 ...1999.00
200/2.8L ...679.95 100-300/5.6 L ..619.95
200/1.8 L ...4499.00 2X APO ...319.95
300/4 L ...1089.00 1.4X APO ...399.95
300/2.8 L ...4599.00 180/3.5 L ...1629.00
400/4.5 L ...5799.00 400/2.8 L ...7249.95
600/4 L ...9199.00 400/5.6L ...1469.00
28-70/2.8 L or 70-200/2.8 L Demo ...1199.95

ACCESSORIES

Quartz Data Back E ...244.95
Technical Back E ...474.95
Focusing Screen For A-2 ...24.95
BP-5 Battery Pack for A2/A2E ...54.95
BP-8 Battery Pack/Rebel X, XS ...29.95
BP-50/BP-5B Battery Pack ...59.95
Special Eyecup ED-E for A2E ...19.50
Screens ...19.95 GR-10 Grip ...44.95
VG-10 Grip ...69.95 GR-70 Grip ...29.95
GR-60 Grip ...29.95 GR-20 Grip ...29.95
RS-60 Remote ...19.95 GR-80 TP Grip ..34.95
Hand Strap for VG-10 Grip ...14.95
Eye Cup ...13.95 RC-1 Remote ...19.95
Bar Code Reader E w/booklet ...44.95
EF Lens Work Book ...24.95
2X Converter For EOS ...79.95
2X - 7 Element Converter For EOS ...119.95
1.5X Converter for EOS ...74.95
Auto Focus Tube 12 ...59.95
AF-25 Extension Tube for EOS ...69.95
Extension Tube Set For EOS ...109.95
Macro Lens Mount Conv FD-EOS ...69.95
Screw Mt. to Canon EOS ...22.50
FD Lens On EOS Camera Adapter ...44.95
T Mount Adapter for EOS ...19.95
Nikon Lens To EOS Adapter ...54.95

LENS CASES

LHB8 ...19.95 LHB9 ...19.95 LHB24 ..29.95
LHB12 ..19.95 LHB15 ..24.50 LHA17 ..19.95
LHC10 ..19.95 LHPB9 ..19.95 LHC13 ..27.50
LHD11 ..54.95 LHC19 ..29.95 LHC21 ..24.50
LHD24 ..38.95 LHD12 ..38.95 LHD13 ..39.95
LHD14 ..39.95 LHD16 ..38.95 LHD18 ..39.95
LHD18839 ..39.95 LHD23 ..49.95 LHD26 ..49.95
LHD29 ..59.00 ESC13 ..29.95 ESC17 ..29.95

LENS HOODS

ET-54, EW-54, EW-60, EW-62, ES-62 ET-62, ..18.50
EW-65, EW-63, ES-65, ET-65, EW-60A, B ..18.50
ES-71 EW-75B, EW-60B, ET-60, ..19.50
ET-83, EW-83B, ES-79, EW-75, EW-79, EW-78 ..34.95
EW-98, EH-123 ..265.95 S-100 Lens Hood ..199.95
EH-150, EH-162, ET-123, Lens Hood ..369.95

FILTERS

Filter Size	52	58	72	77
Sky/Haze (UV)	8.50	9.50	14.95	24.95
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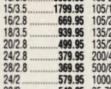

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- Submersible to 500 Feet $48.95

SUPER SABRE-LITE
- Submersible to 2000 Feet $24.95

TUNDRA

SEA KING PROTECTIVE CASES

Dimensions	Foam	Dividers
518(18" x 14" x 5")	79.95	99.95
613(14" x 10.5" x 6.5")	59.95	-
716(17.5" x 11.5" x 6.5")	79.95	Call
718(18.5" x 14.5" x 7.25")	84.95	139.95
821(21.5" x 14.5" x 9")	109.95	159.95
822(22.5" x 19" x 9")	159.95	199.95
827(26.9" x 18" x 8.4")	199.95	249.95

MOST AVAILABLE IN BLACK,GRAY OR YELLOW
Combination Lock ..8.95 Neoprene strap ..19.95

DOSKOCIL

Watertight Cases w/Foam
Large ..... 59.95 Ex Large 69.95
Watertight Cases w/Dividers
Large ..... 99.95 Ex Large 119.95

VIVITAR UW CAMERA KIT
Includes Pocket Camera
Underwater Housing, Sports Finder & Close Up 69.95

GADGET BAGS & CASES

GADGET BAGS & CASES

ZERO HALLIBURTON

ZEROLLER 107
Silver w/Foam 249.95
Black w/Divider 294.95

SILVER OR BLACK W/FOAM

100	132	101	157	102 143
103	162	105	188	106 214
107	184	110	261	111 236
129	387	134	249	Captop 299

SILVER OR BLACK W/DIVIDERS

103	189	105	218

NEW MODULAR DIVIDER CASE

103 ..... 219.95		105 ..... 249.95	

Zeroller Black 319.95
Special 18" Attache Case 179.95

TAMRAC

CALL FOR LOW PRICE

PRO SYSTEM BAGS

608	610	612	613	614
615	620	622	623	624

ROLLING STUDIO & STRONGBOX CASES

660	661	662	644
646	652	654	678

BACK PACKS & DAY PACKS

745	757	767	777	787
635	637	750	752	

CONVERTIBLE BAGS

701	704	706	709

TRAVELER AND ZOOM BAGS

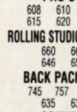
605	607	636	603	604 606

WORLD CORRESPONDENT

818	820	823	826	828

TENBA

CALL FOR LOW PRICE



PRO PACKS

P595
P795
P895
B995

PRO TRAVELER AND TRAVELER

655MF 656 675 676MF
684 695 696
415 513 534 554

VENTURE

307 308 309 354

PHOTO BACK PACKS

PBA (255) PBH-S (267) PBH (257)

METRO PRESS PACKS

839 859 899

AIR CASE AND ALL OTHER TENBA ..... CALL

ZING

35MM CAMERA CASES STD OR LRG

SLR w/o Harness 29.95
SLR w/Harness ..... 34.95 f/Zoom Lenses 34.95
Pro SLR ..... 39.95 Pro Zoom 39.95

GALEN ROWEL

Modular Shoulder Bag 2 w/Belt 119.95
Modular Waist Pack 109.95
Chest Pouch 2 ..... 34.95 w/2 Pockets 54.95
Lens Pouch sm ..... 14.95 Large 19.95
Reporter ..... 89.95 Xtreme 74.95
Action ..... 49.95 Event 39.95

LOWE PRO

PROFESSIONAL AW

Pro Mag 1 AW 130.95
Pro Mag 2 AW 149.95
Magnum AW 161.95
Commercial AW 191.95
Magnum AW for Medium Format 163.95
Commercial AW for Medium. Format 216.95
Compact AW ..126.95 Elite AW 106.95

OMNI SERIES

Omni Pro ..... 135.95 Extreme 3 ..... 111.95
Omni Pro w/Extreme 3 (save $20) 227.95

TREKKING SERIES

Orion AW 122.95
Off trail 37.95
Mini Trekker 99.95
Super Trek AW ..... Call
Photo Trekker ..152.95
Trekker Aw 229.95
Orion Mini ..... 31.95 Off Road 72.95
Photo Runner ..43.95 Trim Trekker 120.95

TOP LOAD SERIES

Zoom 1 ..... 22.95 Zoom 2 ..... 26.95
Zoom AW 49.95

NOVA SERIES

Nova 1 ..... 32.95 Nova 2 ..... 36.95
Nova 3 ..... 39.95 Nova 4 ..... 49.95
Nova 5 ..... 53.95 Nova Micro 24.95
Nova Mini 28.95

DOMKE

F-1X ..104.47 F-2 ..... 82.47 F-3X 65.97
F-4 AF ..86.87 F-5XB ..43.97 F-6 ..... 54.97
F-7 ..... 120.97 F-320 ..54.97 F-801 ..... 38.47
F-802 ..49.47 F-803 ..71.47 F-804 ..... 65.97
F-805 ..... 87.97 F-806 ..... 71.47
F-2 Ballistic ..... 79.95 F1-X Ballistic ..109.95
F-6 Ballistic ..... 54.95 F-3X Ballistic 64.95

EMERALD SERIES

F-2E ..... 93.47 F-802E 71.47
F-6E ..... 65.97 F-803E 87.97

OUTPACK

Back Pack ..164.97 Waist Pack 32.97
Photo Day pack ..109.97 Mini Pack 16.47

SLING & TRIPOD & LENS BAGS

F-400 ..43.97 F-401 ..47.82 F-402 ..... 41.22
F-403 ..49.47 F-427 ..26.37 F-432 ..... 28.57

LIGHTWARE

PRO EQUIPMENT CASES

MF-1629 ..... 359.95 MF-1623 ..... 284.95
MF-1420 ..... 244.95 MF-1217 ..... 224.95
MF-1015 ..... 224.95 MF-912 ..... 184.95

POWER KIT CASES

PK-1200 ..... 224.95 PK-1600 ..... 294.95
PK-1400 ..... 249.95 PK-1800 ..... 339.95

CARGO CASES

C-6052 ..... 204.95 C-6042 ..... 164.95
C-6032 ..... 137.95 C-6024 ..... 117.95
C-6037 ..... 154.95 C-6039 ..... 124.95

LONG LENS CASES

300 ..... 144.95 400 ..... 154.95
600 ..... 169.95 Z Pocket 59.95

F. 64 GADGET BAGS

(Made in U.S.A.)

PROLINE BAGS

All w/Removable Side Pockets
Most Available in Balck, Grey, Blue or Green

SCX Extra Large – Holds 2 SLR's & Lenses
8.5" H x 14" L x 9" D ..... 134 .95

SCM Large – Holds SLR & Lenses
6.5" H x 12" L x 8" D 109.95

SC Medium – Holds SLR & Lenses
6.5" H x 10.5" L x 9" D 79.95

MFX Medium Format – Holds up to 2 MF Bodies & Lenses 8.5" H x 14" L x 9" D..139.95

ACTION BAGS

SG – Holds SLR w/Lens & Flash
6.5" H x 9" L x 8" D 54.95

SU – Holds SLR w/Lens & Flash
4" H x 9" L x 6.5" D 39.95

BACKPACKS

BPX Extra Large – Holds up to 8x10 camera
14" H x 23" L x 6" D 219.95

BP Large – Holds up to 4x5 camera
13" H x 16" L x 6" D 109.95

CANON

Professional Gadget Bag 1 ..... 84.95
Deluxe Gadget Case 10 ..... 79.95
Deluxe Gadget Bag 10 ..... 59.95
Custom Gadget Bag 100 ..... 29.95
Professional Back Pack 1 ..... 59.95
Deluxe Back Pack 10 ..... 44.95
Custom Gadget Bag 200 ..... 29.95

OP/TECH

FASHION STRAP

Neoprene Weight Reduction
Strap w/Quick Release 16.95

S.O.S. BAG STRAP

Neoprene Weight Reduction
Strap w/Non-Slip Grip 26.95

SUNDOG

AW Photo Backpack 4 in 1 system 229.95
AW Photo Daypack Medium 109.95
AW Photo Daypack Large 119.95
Convertible Fanny Pack Small 99.95
Convertible Fanny Pack Large 109.95
Modular Photo Fanny 49.95

AUTO FOCUS LENSES & ACCESSORIES

SIGMA

SIGMA "ALL IN ONE" ZOOM LENSES

FOCUS	MANUAL	MINOLTA MAXXUM	CANON EOS SIGMA SA	NIKON AF	PENTAX AF
18-35/3.5 UC	349.95	349.95	349.95	349.95	349.95
21-35/3.5	249.95	299.95	359.95	349.95	-
24-50/4	119.95	119.95	119.95	119.95	119.95
24-70/3.5-4.5.6 Aspherical	139.95	139.95	139.95	139.95	139.95
28-70/2.8	254.95	254.95	254.95	254.95	-
28-70/2.8-4 UC	109.95	109.95	109.95	109.95	109.95
28-80/3.5 Aspherical Macro	84.95	84.95	84.95	84.95	-
28-105/4-5.6 UC	149.95	149.95	149.95	149.95	-
28-200/3.8-5.6	179.95	179.95	179.95	-	-
28-200/3.5 Aspherical Macro	179.95	179.95	179.95	179.95	179.95
35-80/4-5.6 DL	49.95	49.95	49.95	49.95	49.95
70-210/3.5-4.5 Apo Macro	249.95	249.95	249.95	249.95	249.95
70-210/4-5.6 APO	179.95	179.95	179.95	179.95	179.95
70-210/4 UC	99.95	99.95	99.95	99.95	99.95
70-210/2.8 APO	599.95	599.95	599.95	599.95	-
70-300/4-5.6 APO Macro	244.95	244.95	244.95	244.95	244.95
70-300/4-5.6 DL Macro	169.95	169.95	169.95	169.95	-
75-300/4.5-5.6 APO	239.95	229.95	249.95	-	-
135-400/4-5.6 Aspherical	-	549.95	549.95	549.95	549.95
170-500/5.0-6.3 Aspherical	-	679.95	679.95	679.95	679.95

"ALL IN ONE" SPECIAL PRO LENSES

14/3.5	549.95	549.95	549.95	549.95	-
18/3.5 Aspherical	289.95	284.95	284.95	284.95	-
24/2.8	149.95	149.95	164.95	149.95	149.95
28/1.8 Aspherical	164.95	164.95	164.95	164.95	-
50/2.8 Macro	199.95	199.95	199.95	199.95	-
90/2.8 Macro w/AML	299.95	299.95	299.95	299.95	-
180/2.8 APO Macro	649.95	649.95	649.95	649.95	-
180/5.6 APO Macro	264.95	264.95	309.95	264.95	-
300/4 APO Macro	529.95	529.95	539.95	539.95	539.95
300/2.8 APO	1999.90	1999.90	1999.90	1999.90	-
400/5.6 APO Macro	549.95	549.95	549.95	549.95	549.95
400/5.6 APO	399.95	399.95	449.95	449.95	-
500/4.5 APO	2999.00	2999.00	2999.00	2999.00	-
500/7.2 APO	549.95	549.95	579.95	549.95	-
600/8 Mirror	329.95	329.95	329.95	329.95	329.95
800/5.6 APO	-	5699.95	5699.95	5699.95	-
1000/8 APO	-	4399.95	4399.95	4399.95	-

LENS ACCESSORIES & FLASH

1.4X Tele-Extender	-	184.95	184.95	184.95	184.95
280 Flash	-	74.95	79.95	79.95	69.95
EF430 Flash	-	164.95	164.95	164.95	-

Wide Panel Diffuser for EF-430 ..... 19.95 Sigma 72mm Close-Up-Lens for 28-200/3.8..29.95
RS-21 Remote ..... 19.95 58mm Close-Up Lens for 70-300 ..... 39.95

TAMRON

(Aspherical)	Minolta Maxxum	Nikon AF	Pentax AF	Canon EOS
*20-40/2.7-3.5	599.95	599.95	-	599.95
24-70/3.3-5.6	199.95	199.95	-	199.95
28-80/3.5-5.6	194.95	194.95	-	194.95
28-70/3.5-4.5	124.95	124.95	-	-
28-200* Super	289.95	289.95	289.95	289.95
28-200/3.8-5.6	269.00	269.00	269.00	269.00
35-105/2.8 ASL	699.95	749.95	-	689.00
200-400/5.6 LD	429.95	429.95	-	429.95
*70-210/2.8 LD	899.00	899.00	-	899.00
70-210/4-5.6	129.95	129.95	-	-
80-210/4.5-5.6	114.95	114.95	-	114.95
70-300/4.5/6	239.95	239.95	-	239.95
*300/2.8 LD w/1.4X	2599.95	2599.95	-	2599.95
90 F28* Macro	439.00	439.00	-	439.00
1.4X	189.00	189.00	-	189.00
2X AF	134.95	134.95	134.95	134.95

NEW Close Up Lens For 28-200 72mm ..29.95
***FREE CIRCULAR POLARIZER OFFER**

TOKINA

	Minolta Maxxum	Nikon AF	Pentax AF	Canon EOS
17/3.5 Aspherical	319.95	309.95	-	319.95
300/2.8 SD APO	1899.95	1899.95	-	1899.95
100/2.8 Macro	349.95	349.95	-	349.95
20-35/3.5-4.5 HLD	229.95	239.95	254.00	249.95
28-70/2.8 ATX	234.95	-	-	299.95
28-70/2.6 PRO	424.95	409.95	424.95	424.95
24-40/2.8	399.95	399.95	-	399.95
28-70/2.8-4.5	119.95	119.95	-	124.95
28-80/3.5	99.95	99.95	-	109.95
28-210	159.95	159.95	-	-
60-300/4.0-5.6	169.95	169.95	-	-
70-210/4.5-5.6	99.95	99.95	99.95	109.95
80-200/2.8 PRO	699.95	669.95	699.95	699.95
80-200/2.8 APO	469.95	469.95	-	499.95
80-400/4.0-5.6	599.95	599.95	-	599.95
100-300/4.0 APO	499.95	649.95	-	699.95
300/4 APO	619.95	619.95	-	619.95
400/5.6 SD APO	379.95	379.95	379.95	389.95
100-300/5.6-6.7	124.95	129.95	-	139.95
75-300/4.5	194.95	194.95	194.95	194.95
28/300 F4.6.3	239.95	239.95	-	239.95

Close Up Lens for 80-400/4 ..... 99.95

PHOENIX

MADE IN JAPAN 6 YEAR WARRANTY for AUTO FOCUS SLR CAMERAS

	MAXXUM AF	NIKON AF	CANON EOS
100/3.5 Macro	**159.95**	**159.95**	**179.95**
19-35/3.5-4.5	169.95	169.95	189.95
28-70/3.5-4.5	119.95	119.95	129.95
28-105/2.8-3.8	189.95	189.95	209.95
28-210/3.5-5.6	179.95	179.95	199.95
28-300/4-5.6	259.95	259.95	279.95
60-300/4-5.6	229.95	229.95	-
70-210/4.5-5.6	-	-	179.95
100-300.5.6-6.7	149.95	149.95	174.95
100-400/4.5-6.7	**299.95**	**299.95**	**319.95**
2x7 Element	129.95	129.95	129.95

LENS ACCESSORIES

Tele Extenders For Auto Focus Lenses
2x7 Element Eos. Max. Nikon, Pen 119.95
2x4 Element Eos. Max, Nikon, Pen 79.95
2x4 Element Nikon AF 84.95
1.4x/1.5x/1.7x 74.95

VIVITAR AF LENSES

	MAXXUM AF	NIKON AF	CANON EOS
28-80/3.5	89.95	89.95	99.95
28-210/3.5	129.95	129.95	149.95
70-210/4.5	109.95	109.95	109.95
100-300/5.6	129.95	129.95	149.95
100/3.5 Macro	149.95	149.95	169.95
1.4X AF	59.95	59.95	59.95
2X AF	79.95	79.95	79.95

VIVITAR SERIES 1

	MAXXUM AF	NIKON AF	CANON EOS
19-35/3.5	154.95	154.95	174.95
28-70 28	249.95	249.95	319.95
28-105/4.0	169.95	169.95	199.95
28-200/3.8	231.00	231.00	249.95
28-300/4	229.95	229.95	249.95
100-400/4.56.7	260.95	260.95	289.95
70-210/2.8	499.95	599.95	599.95
70-210/2.8-4.0	234.95	234.95	259.95
2x AF Converter	124.95	124.95	124.95

HOW TO CLEAN YOUR LENS PROPERLY
LELAND POWER CLEAN
Ozone-safe dust & particle remover
38gr System ..17.95 Refill 6.25
74gr System ..24.95 Refill 9.95
Schneider 12X15" Photo Clear Cloth
The Best Cloth To Use 14.95

2 LENS SPECIAL
Buy ANY 2 Lenses from ANY Company, Get $39.95 Value Gadget Bag for $9.95

BINOCULARS

SPOTTING SCOPES BINOCULARS

BAUSCH & LOMB

DISCOVERER
ZOOM 15x60 POWER TELESCOPE
1000-4000 Zoom on SLR Body
$165.95

Camera Mount 19.95
Soft Case ..... 16.95 Hard Case 59.95
Car Window Mount 34.95
Field Tripod ..... 39.95 Deluxe 59.95
Master Tripod ..59.95 Tall Tripod 99.95
Spacemaster Spotting Scopes ..... Call

Spacemaster II
70mm Prismatic Telescope with 15x45 Zoom, Tripod & Case 239.95

ELITE

8x42 Armored ..... 547 8x42 Water 749
10x42 Armor ..... 729 10x42 Water 799
Special 7x36P 449

DISCOVERER

7x24 A/WP ..... 259 10x28 A/WP 269
10x50 CF 249

CUSTOM

7x26 Compact ..... 229 10x40 Armor ..249.95
8x36 ..... 219.95

LEGACY

7-15x35 ..... 129.95 8-24x50 ..... 139.95
7x35 EX W/A ..... 79.95 8x40 W/A 84.95
8x22 FRP ..... 39.95 9x25 Compact 76.95
8x24 ..69.95 10x25 FRP ..39.95 10x25 ..84.95

LASER RANGEFINDER

LYTE speed 400 #1 ..... 229.95
NIGHT RANGER ..... CALL

BUSHNELL

TROPHY (Water & Fog Proof)

8x25 Compact ..57.30 10x25 Compact ..59.95
8x32 ..... 129.95 10x42 ..... 139.95

SPECTATOR

7x15x35 ..... 99.95 8x21 ..... 29.95
7-21x40 ..... 109.95 8x40WA 64.95
7x35 ..... 49.95 8x42 ..... 59.95
7x50 ..... 49.95 10x50WA 79.95

BIRDING

8x40 ..... 39.95 8x42 ..... 79.95
8X30 ..... 64.95 10x42 ..... 89.95

ENSIGN COMPACT

7X25 ..... 29.95 7X50 Black Armored..44.95
10x50 ..... 54.95

WATERPROOF

7X42 ..... 139.95 7X50 ..... 99.95
8x25 Angler or Polarized 59.95

CANON

8x22A Ultra Compact Roof Prism 129
8x23AWP Compact Waterproof 169
8x32AWP Waterproof Roof Prism 199
10x25A Ultra Compact Roof Prism 139
12x36IS w/Image Stabilizer ..... $75 Rebate
Battery For 12x36 ..... 99.95

MINOLTA

ULTRA COMPACT

6x18 ..... 89.95 8x18 ..... 149.95

COMPACT

8x23 ..... 69.95 8x24 W 54.95
8-17x25 Zoom ..104.95 10x23 ..... 83.95

POCKET

7x21 ..... 61.95 8x22W 84.95
9x25 ..... 87.95 10x25W 89.95

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7x35EW ..... 44.95 7x50XL 106.95
10x50EW ..... 79.95 7x21x50 ..... 119.95
7x50EW ..... 67.95 8-20x50 ..... 129.95
7-15x35 ..... 127.95 10x50XL 112.95
7x35XL ..... 91.95 12x50XL 109.95

EZ

8x20 Pocket ..... 54.95 8x21 Compact ..47.95
7x35W ..... 49.95 7x50 ..... 61.90
8x30 ..... 52.95 10x50 ..... 58.95
7x15x35 ..... 83.90 8x20x50 ..... 93.90

MARINER (Waterproof)

8x32 ..... 189.95 10x40 ..... 199.95
8x16x32 ..... 289.90

WEATHERMATIC (Waterproof)

8x23 ..... 138.95 10x23 ..... 149.95
7x50 ..... 189.95 10x42 yellow ..219.95

AUTOFOCUS

8x23* ..109.95 10x23 ..129.95 10x25 ..129.95

ZEISS

COMPACT/POCKET

8x20 ..... 279.95 10x25 ..... 319.95
8x20 B ..... 329.90 10x25B 369.95

RUBBER ARMORED

7x42 ..... 839.90 8x20 ..... 369.95
8x30 ..... 679.90 8x30 CFT 689.90
8x56 ..... 939.90 10x40 ..... 778.90
15x68 ..... 1679.99 20x60 ..... 3899.90
7x50B IFT 939.95

NIGHT OWL (Rubber Armored)

7x45B ..939 8x56B .1029 10x56B.1119

SIGMA

25 YEAR WARRANTY
INCLUDING CASE & STRAP

KRYSTAL SERIES

8x22 ..... 119.95 8x32 ..... 239.95
10x25 ..... 139.95 10x42 ..... 249.95

SERIES 7000

7x35 ..... 149.95 8x40 ..... 159.95
7x50 ..... 169.95 10x50 ..... 189.95

SERIES 9000

7x35 ..... 89.95 7x50 ..... 119.95
8x40 ..... 119.95 10x50 ..... 159.95
12x50 ..... 169.95 16x50 ..... 179.95

DIAMOND SERIES

8x22 ..... 99.95 10x25 ..... 129.95

KENKO

Spotting Scope & Binoculars ..... Call

NIKON

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7x20 ..... 54.95 9x25 ..... 69.95
8x23 ..... 64.95 10x25 ..... 79.95
NEW 12x25 ..... 93.95
NATIONAL GEOGRAPHIC SOCIETY BOOK INC.
9x25 ..... 104.95 10x25 ..... 113.95

SPRINT

8x21 ..... 57.95 10x21 ..... 65.95
7x21 New ..... 53.95 9x21 New 58.95

COMPANION POCKET

8x20 D ..... 88.50 10x25 D 104.95

COMPANION DELUXE

8x20D ..... 149.95 10x25D 176.95
6-12x24D Zoom 339.95
10x25 Mountaineer 209.95
8x23 Mountaineer 189.95

ACTION SERIES

7x35 CF ..... 49.95 7x35 Naturlist..72.95
8x42 ..... 189.95 7-15x35 ..... 137.95
10x42 ..... 199.95 8x40 IF SP 77.95
8x40 Egret ..... 77.95 10x50 Lookout ..93.95

CRITERION

8x32D ..... 329.95 10x70 IF 499.95
8x40D ..... 449.95 10x40D 374.95
7x35E ..... 169.95 10x35 E 199.95
7x50 IF SP ..... 629.95 8x30E 266.95
8-16x40 CF Zoom XL 499.95
10x42 Superior E ..533 10x70 Astrolux E ..989

SEA & SPORTS

8x30 DIF ..... 339.95 6x15 MONO 59.95
7x50 if rc Seafarer (Grey) 399.95

SKY & EARTH

7x35 Lemur ..... 104.95 7x50 Wolu 126.95
8x40 Talon ..... 115.95 10x50 Kess 129.95

FIELD & SPOTTING SCOPES

Fieldscope 78mm ED Body 819.95
Fieldscope 78mm ED Angled Body 949.95
Eyepieces ..... Call Photo Attchmnt..179.95
7836 Fieldscope 11A w/zoom 20-45 ..... 449.95
7832 Fieldscope 11 w/zoom 20-45x60 ..299.95
7838 Fieldscope 11A Body 349.95
7837 Fieldscope ED 599.95
7709 Fieldscope ED 20x60 Scoutmaster..449.95
7894 Fieldscope 60mm E 279.95
7895 Fieldscope 60mm ED 479.95
16-47x60 Spotter XL 349.95

BINOCULARS BLOWOUT!

7827 8x20 Letour..129.95 7828 10x25 Letour..139.95
7893 10x70 SP 350.95
7794 7x50 Tropica IXP 269.95
7855 7x50 CF Starvue 129.95
7858 10x50 CF Sentinol 139.95
777 8x300 ..... 119.95
7895 7x35 Sporter Gold Sent 119.95
7856 8x35 Eaglescout Gold Sent 129.95
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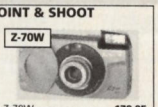

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Pro Optic Starter Pack Consists of Filter Holder, Lens Shade, Protective Lens Cap, 42 Page Color Brochure, Filter Pouch, Star 6 Filter #58, Close-Up +4 #104, Grad. Light Blue Filter #122, Skylight Filter #23, ... 34.95

Pro Optic Bright Light Kit Consists of Filter Pouch , Star 4 #57, Star 6 #58 , Spot #60, 36x Diffraction #42, Star 8 w/Diffraction #44 ..... 44.95

Portrait Kit Consists of Filter Pouch, Diffuser 1 #83, Diffuser 2 #84, Center Spot 1 #60, Center Spot 2 #61, Grey Center Spot #63, 81C #28 ..... 39.95

Landscape Kit Consists of Filter Pouch, Grad Diffuser #135, Fog 1 #150, Sunset 1 #197, Grad light Grey #120, Grad Dark Tobacco #125 ..... 39.95

Black and White Kit Consists of Filter Pouch , Yellow #1, Green #4, Orange #2, Red #3, Grey Net #95 ..... 34.95

Pro-Optic® Effects Filters *have the largest range of filters and are compatible with all square filter systems. The unique Snap-on Holder takes up to four filters allowing literally thousands of combinations. Unique snap-fit holder for instant changing between lenses. Completely modular system with superior quality.*

Filter Holder –	With Book, Lens Shade, & Lens Cap		5.95
Adapter Rings –	40.5, 46, 49, 52, 55, 58, 62mm	Each @	3.95
B&W FILTERS –	Yellow, Orange, Red, Green, Sepia		6.50
Conversion Filters –	80A, 80B, 80C, 82A, 82B, 82C, 81A, 81B, 81C,		6.50
Conversion Filters –	85A, 85B, 85C, FLW, FLD,		6.50
Diffraction Filters –	2X, 4X, 36X, Star/Diffraction 4X, 8X		11.95
StarBurst Filters –	Star 4, 6, 8		8.95
Center Spot Filters –	1, 2, Gray, Violet, Green, Orange, Blue, Red		6.50
Wide Center Spot Filters –	1, 2, Gray, Violet, Green, Orange, Blue, Red		6.50
Oval Center Spot Filter –	1, 2, Gray, Blue, Red		6.50
Diffusion & Fog Filters –	Diffuser 1, 2, / Fog 1 ,2		7.95
Color Net Filters –	White, Gray, Violet, Green, Orange, Blue, Red		7.95
Close Up Filters –	+1, +2, +4,		7.95
Graduated Filters –	Light Gray, Dark Gray, Light Blue, Dark Blue, Light Tobacco, Dark Tobacco, Light Mauve, Dark Mauve, Light Red, Dark Red, Light Green, Dark Green, Light Yellow, Dark Yellow,		8.95
Graduated Sunset –	1, 2,		8.95
Graduated Soft Filters–	Soft 1, Soft 2,		7.95
Neutral Density –	ND2X, ND4X,		6.50
Sky Light	4.50	**Multi Image** 3, 5, 7,	12.95
Linier Polarizer	10.95	**Circular Polarizer**	16.95
Split Field	8.95	**Speed**	14.95
Double Mask 1, 2,	8.95	**Double Exposure**	4.50
Polyester Color Set	14.95	**Gel Holder**	4.50
Conversion Set	24.95	**Pre Shaped Frame**	9.95

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SLR Systems

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LENSES

Tokina LENSES

A Revolution in Focal Length. 80–400mm f/4.5-5.6 SD APO

A compact 5.4" lens takes a 72mm filter, it is like getting two powerful lenses in one very small package. Rugged all metal barrels, ideal for sports the outdoors and action shots. A versatile focal range.

LENS	Man. Focus	Maxxum	EOS	Nikon AF	Pentax
17/3.5	Call	—	—	—	—
17/3.5 ATX AF	—	369.00	369.00	369.00	—
28/2.8	Call	—	—	—	—
90/2.5 ATX Macro	Call	—	—	—	—
1:1 Macro Ext.	89.95	—	—	—	—
100/2.8 ATX AF Mac	—	Call	Call	Call	—
300/4 ATX APO AF	—	Call	Call	Call	—
300/2.8 ATX APO	Call	Call	Call	Call	—
400/5.6 SD	Call	—	—	—	—
400/5.6 ATX APO AF	—	439.00	Call	Call	—
20–35/3.5–4.5 Mac AF	—	Call	Call	Call	Call
24–40/2.8 ATX AF	274.95	Call	Call	Call	—
28–70/3.5 Macro SD	Call	—	—	—	—
28–70/2.8-4.5 Mac AF	—	109.95	—	—	—
28–70/2.6-2.8 ATX Pro	—	499.00	499.00	499.00	499.00
28–80/3.5–4.5	—	104.95	104.95	104.95	—
28–105/3.5-4.5	Call	—	—	—	—
28–200/3.5-5.6	Call	—	—	—	—
28–210	—	164.95	214.95	174.95	—
28–300 4/6.3	—	254.95	269.95	269.95	—
70–210/4–5.6 Macro	Call	—	109.95	—	—
75–300/4.5–5.6	Call	Call	Call	Call	—
80–200/2.8 ATX APO Pro	—	799.00	799.00	799.00	—
80–400/4–5.6 ATX APO	—	699.90	699.90	699.90	—
100–300/4 ATX AF	—	Call	Call	Call	—
150–500/5.8 ATX	Call	—	—	—	—
2X Teleconverter	89.95	129.95	129.95	129.95	129.95

TAMRON LENSES

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24/2.5_22	249.00	—	—	—	—
90/2.5 SP Macro	279.00	—	—	—	—
1:1 Macro Ext.	59.95	—	—	—	—
New 90/2.8 Macro (1:1)	—	439.00	439.00	439.00	—
300/2.8 LD IF	2169.00	2649.00	—	2649.00	—
500/8 Macro	369.00	—	109.95	—	—
20–40/2.7–3.5 AF	—	674.00	674.00	674.00	—
24–70/3.3–5.6 AF	—	239.00	239.00	239.00	—
28–70/3.5–5.6	159.00	* 109.00	—	—	—
28–80/3.5–5.6 AF	—	129.00	129.00	129.00	—
28–200/3.8–4.5	299.00	—	—	249.00	—
28–200/3.8–5.6 Super	—	329.00	329.00	329.00	329.00
35–135/3.5	299.00	—	—	—	—
60–300/3.8–5.4	349.00	—	—	—	—
70–210/4–5.6	159.00	—	—	—	—
70–210/3.5 SP	349.00	—	—	—	—
70–210/2.8 LD AF	—	899.00	899.00	899.00	—
70–300/4–4.5 AF	—	259.00	259.00	—	—
New 70-300/4/5-6 "LD"Glass	—	279.00	279.00	279.00	—
80–210/4.5–5.6 AF	—	149.00	149.00	149.00	—
200–400/5.6 LD IF AF	—	579.00	579.00	579.00	—

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with purchase of Tamron 200-400 Zoom ($98 Value)

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1.4X Teleconverter	—	109.00	109.00	109.00	—

* Discontinued Special Order

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28/2.8	62.95	New 100-300/5.6-6.7	109.95
100/3.5 Macro	119.95	100-500/5.6-8	429.95
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		100-400/4.5-6.7 249.	269.

ΣSIGMA LENSES

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14/3.5	579.00	575.00	579.00	–	–
18/3.5	—	324.00	325.00	325.00	–
24/2.8	169.00	169.00	169.95	165.00	164.95
28/1.8	174.95	174.95	174.95	164.95	–
50/2.8 Macro	214.95	214.95	223.95	219.95	–
90/2.8 Macro	309.95	309.95	316.95	319.95	–
180/2.8 APO Mac.	769.00	749.00	769.00	749.00	–
180/5.6 APO Mac.	309.95	319.95	319.00	329.00	–
300/2.8 APO	2149.00	2149.00	2149.00	2149.00	—
300/4.0 APO Mac.	564.95	569.00	564.95	564.95	–
400/5.6 APO Mac.	589.95	589.95	589.95	589.95	—
500/4.5 APO	3190.00	3139.00	3139.00	3139.00	—
500/7.2 APO	—	509.00	—	599.00	—
600/8	364.00	359.00	359.00	359.00	—
18-35/3.5-4.5 UC	384.95	384.95	384.95	384.95	—
24-70/3.5-6 UC	151.95	154.95	154.95	154.95	154.95
28-70/2.8-4 UC	124.95	124.95	124.95	124.95	124.95
28-70/2.8	289.00	289.95	289.95	289.95	—
28-80/3.5-5.6 Aspher	—	99.95	99.95	99.95	—
28-105/4-5.6 UC	173.95	174.95	174.95	174.95	—
28-200/3.8-5.6 Asph	—	229.95	229.95	229.95	229.95
35-80/4-5.6	—	—	—	79.95	—
70–210/4-5.6 UC II	124.95	124.95	124.95	124.95	124.95
70–210/3.5-4.5 APO	279.95	274.95	274.95	274.95	—
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New 135–400/4.5–5.6 APO Aspherical	549.95	549.95	549.95	549.95	—
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#738 Filter Kit f/300,400	27.95
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#841 Tele-Fil f/400's 383	29.95
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60-CT 4 Dryfit	674.95
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065 200 w/s	Call
065X 200 w/s	Call
067X 400w/s	Call

PACK W/LOW BATT. IND.

065L 200 w/s	Call
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bogen

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3000	79.95	3001	59.95
3003	97.90	3004	117.95
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3014	127.95	3013	107.95
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3016	25.95	3017	45.95
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3223	157.95	3224	137.95
3235	223.95	3234	199.95
3240	199.95	3236	165.95
3250	247.95		

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3140	224.95	3170	103.95
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3130	54.95	3030	44.95
3038	144.95	3039	119.95
3047	57.95	3160	53.95
3265	61.95	3232	13.95
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3262 Med. Ball Hd w/Q.R.			38.95
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SLIK

Monopods

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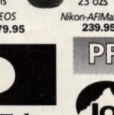
Flash Caddy 33.50 Lens Caddy	17.95

AUTOFOCUS LENSES

19-35mm f3.5-4.5 AF Ultra Wide Angle Zoom



Ultra-wide angle zoom lens perfect to capture all your creative ideas. Landscapes are great with this wide view lens

Nikon-AF/Maxxum	*EOS*
154.95	179.95

28-300mm f4-6.3 AF Wide to long Tele Zoom

Despite it's extreme zoom ratio this lens is very compact (only 4.8" long) and weighs only 23 ozs

Nikon-AF/Maxxum	*EOS*
239.95	249.95

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312	359.95		
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346	382.95	347	519.95

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563	79.95	1563	89.95
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1171			114.95
1172 1	129.95	1270	104.95
1370	154.95	1371	139.95
1372	144.95	472	169.95
1570	199.95		

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1275	109.95		
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1276 w/Quick Release			138.95
1375	148.95	1376	184.95
475			164.95
1575	199.95	1576	214.95

NEW VIDEO HEADS

1380-7	799.95	1380-10	819.95

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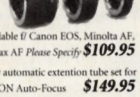

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Fieldscope 78mm ED

Fieldscope **989.00**
Angle Fieldscope **1079.95**
Photo attachment **174.95**
20-45x Zoom **144.95**
15, 20, 30, 40X **Ea. 74.95**
60X **79.95** 30x WA **139.95**
New 24x W.A. **144.95**

Spotting Scopes

15-45x Spotter RC **339.95**
15x 45 Angle R/C **354.95**
20x Angle R/C **234.95**
Camera Adapter **14.95**

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16-47 x 60 XL **379.95**
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ATTACHE SERIES

8x42 **194.95** 10x42 **214.00**

Zoom Series

7x15x35 Scoutmaster II **159.00**
New 8-20x25 **139.95**

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8x24 **Call** 10x24 **Call**
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12x24 **Call** 16X24 **Call**

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12x50 **Call** 16x50 **Call**
20x50 **Call**

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F/ Stock on Hand Only
15x80 Observor w/Cmpss **799.95**
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30,000X Binocular 2.5X Magnification **429.95**
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COMPACT HIGH PERFORMANCE Night Vision SCOPE
with Illuminator
$149.95

Unique features include a special tube protection device to eliminate over-exposure, and infrared illuminator used in total darkness. Can be hand held or mounted on a standard tripod.
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with Pouch Case

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Kodak DCS-460 Digital Camera . . . . . **Call**
Kodak Canon DCS-3 Digital Camera . . . . . **Call**
Kodak Canon DCS-1 Digital Camera . . . . . **Call**
Nikon/Fujix E2/E2S Digital Camera . . . . . **Call**
Chinon ES 3000 3X Zoom . . . . . **Call**
Polaroid PDC 2000 40 Digital Camera . . . . . **Call**
Ricoh RDC-1 Mini Digital Camera . . . . . **Call**
Epson Photo PC Digital Camera . . . . . **Call**
Casion QV30 Digital Camera . . . . . **Call**

Scanners

Nikon LS-1000 Super Cool Scan Slide Scanner . . . . . **Call**
Nikon LS-20 Cool Scan II . . . . . **Call**
Nikon AX-1200 Scantouch Flatbed Scanner . . . . . **Call**
Nikon LS-4500 Multi Format Slide Scanner . . . . . **Call**
Polaroid Sprint Scan Slide Scanner . . . . . **Call**
Polaroid Sprint Scan45 4x5 Scanner . . . . . **Call**
Minolta Quick Scan Slide Scanner . . . . . **Call**
Agfa Arcus II Flatbed Scanner . . . . . **Call**
Agfa Studio Scan IISI Flatbed Scanner . . . . . **Call**
Agfa RFS 2035 Pro Slide Scanner . . . . . **Call**
Agfa RFS 3570 Pro Slide Scanner . . . . . **Call**

Printers

Kodak XLS 8650 Dye Sub Printer . . . . . **Call**
Kodak XLS 8650 PS Dye Sub Printer . . . . . **Call**
Kodak XLS 8650 PS CMYK Dye Sub Printer . . . . . **Call**
Fargo Primera Pro Dye Sub Printer . . . . . **Call**
Fargo Pictura 310E 11x17 Dye Sub Printer . . . . . **Call**

TELESCOPES & SPOTTING SCOPES

COMPLETE WITH ALL MANUFACTURES ACCSESSORIES

CELESTRON

PRECISION OPTICS

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C90 M/C 1.25" Special -Edition w/Pro Optic 1.25" 25mm Plossl Only **349.95**

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78-1217 Rub. Kit **259.95**
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15x45 Rubber w/cs. **Call**
77mm ELITE
61-0077 77mm **269.**
61-7700 77mm ED **Call**

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SPOTTING SCOPE TELEPHOTO LENS

with Case

Fast f/5.6, Short 8.5" (weighs 2 lbs. 11 oz.) May be used as a Spotting Scope with Optional Conversion Kit **with Case** . . . . . only **209.95**
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Spotting Scope Conversion Kit* **49.95**
(* with purchase of the Pro-Optic 500/5.6)
CELESTRON 1000m f/11 Multi-Coated Lens Only **289.95**

25 Year Warranty **Pro-Optic**

We are proud to introduce a new line of Pro-Optic Giant fully Multi-Coated Binoculars.
These binoculars with their large objectives high quality BAK-4 prisms will provide you with breathtaking wide-field observation of astronomical objects as well as terrestrial viewing under low light conditions.

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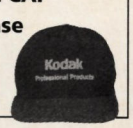

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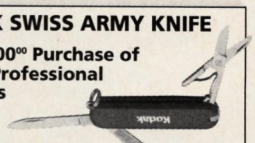

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The Offer is Simple, No UPC Tabs Needed, With every Qualifying KODAK PROFESSIONAL products order your FREE GIFT will be included *(While Supplies Last)*

KODAK FILM

COLOR PRINT FILM *35mm*

film	ASA	135-24 DI	135-24 Roch.	135-24 Proc. DI	135-24 Proc. Roch.	135-36 DI	135-36 Roch.	135-36 Proc. DI	135-36 Proc. Roch.
GA	(100)	1.89	2.75	8.18	9.04	2.39	3.79	11.08	12.48
GB	(200)	2.20	3.20	8.49	9.49	2.65	3.90	11.34	12.59
GC	(400)	2.35	3.39	8.64	9.68	2.90	4.30	11.59	12.99
Royal Gold RZ	(25)	-	4.29	-	10.28	-	4.79	-	13.48
Royal Gold RA	(100)	-	3.65	-	9.68	-	4.49	-	13.18
Royal Gold RB	(200)	-	4.35	-	10.28	-	5.29	-	13.98
Royal Gold RC	(400)	-	4.65	-	10.68	-	5.44	-	14.13
Royal Gold RF	(1000)	-	5.25	-	11.54	-	6.59	-	15.28
Special GA 36	50 Pack					112.49	199.95	546.99	634.45

SLIDE FILM *35mm*

	ASA	135-24 DI	135-24 Roch.	135-24 Proc. DI	135-24 Proc. Roch.	135-36 DI	135-36 Roch.	36X w/KODAK PR. DI	36X w/KODAK PR. Roch.	36X w/FUJI P/. DI	36X w/FUJI P/. Roch.
KM	(25)	-	4.25	-	7.64	-	5.89	-	10.18	-	-
KR	(64)	-	4.25	-	7.64	-	4.65	-	8.94	-	-
Elite EA	(50)	—	—	-	-	5.90	6.30	10.19	10.59	8.99	9.39
Elite EB	(100)	3.79	4.39	7.16	7.76	3.94	5.79	8.28	10.08	7.03	8.88
ET	(160)	5.09	5.29	8.48	8.66	6.49	7.29	10.78	11.58	9.58	10.38
Elite ED	(200)	4.84	5.39	8.21	8.78	5.44	6.79	9.73	11.08	8.53	9.88
KL	(200)	-	5.19	-	8.58	-	7.09	-	11.38	-	-
Elite EL	(400)	5.69	6.30	9.06	9.69	6.79	8.25	11.08	12.54	9.88	11.34

KODAK SHEET FILM USA

COLOR PRINT	4x5 10	4x5 50	8x10 10	8x10 50
4106 (VPS)	16.15	73.40	60.59	–
4108 (VPL)	16.25	74.50	–	–
4111 (Vericolor)	10.49	–	36.69	163.75
4112 (VC intrng)	17.29	79.75	64.95	304.50
4325 (Comm Int.)	17.85	73.50	65.95	297.95
4329 (PRN)	16.75	74.95	64.95	–
New! PRT (100T)	16.25	74.50	62.95	–

COLOR SLIDE	4x5 10	4x5 50	8x10 10	8x10 50
6117 (EPR)	16.49	74.79	61.49	274.95
6118 (EPY)	15.95	71.95	59.95	275.95
6121 (DUP)	38.95	67.49	131.50/25	249.25
6105 (EPP)	16.85	76.95	65.49	293.00
7058 (EPN)	16.99	77.99	64.20	299.59
6176 (EPD)	17.95	81.85	68.90	320.95
E100 S	16.99	79.95	67.95	317.95
E100 SW	16.99	79.95	67.95	317.95

BLACK & WHITE	4x5 25	4x5 100	5x7 100	8x10 25	8x10 50
4147 (PX)	14.19	54.29	92.95	49.99	97.49
4164 (TX)	14.29	54.89	89.50	47.50	93.90
4052 (TMX)	14.29	54.95	89.50	47.50	–
4053 (TMY)	14.95	56.95	94.95	49.75	–
S0339 (DUP)	32.95	–	–	99.95	–
4125 (Copy)	21.95	77.95	127.95	–	139.95
2556 (Ortho)	–	48.95	–	100 Sht.	144.95
4143 (HIE)	44.89	–	–	–	–
4415 (TP)	31.95	–	–	106.95	–

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64T (64) 43.95
EPP (100) 44.95
PRN (100) 47.95
TMX (100) 31.95
E100S 46.95
E100SW 46.95
Ready Load Holder ... 52.95
HP Combo Plan T Sys. . 45.95

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DP-12 ..... 4.49 DP-24..... 6.29
DPD-12/24 (f/Disposable)..... 7.85
DP-36 ..... 8.69
for Slides
PK-12..... 5.59 PK-24..... 3.37
PK-36..... 4.29 ESP-1 *(push)* 2.69
PK-59 *(Movie)*..... 5.59
for Posters
PP-1218.....11.99 PP-2030 13.49
Fuji Slide Mailer *(36X)*..... 3.09
for PHOTO CD
DT-24 ..... 14.95 DT-36 ..... 19.95
PKT-24 ... 19.00 PKT-36 .... 29.95

PRO COLOR PRINT FILM USA *35mm 120/220*

Film		135 -36	36X . with PROC	135 36 PP	120 Single	120 ProPak	220 ProPak
PHR	(25)	5.65	14.24	–	3.99	–	–
PJA	(100)	3.79	12.48	18.95	–	–	–
PRN	(100)	5.35	14.04	26.75	3.30	16.50	30.95
New! PRT	(100T)	–	–	–	3.25	16.25	–
VP	(120)	–	–	–	2.19	–	–
VPS	(160)	5.09	13.78	25.45	3.25	16.25	32.50
VPL	(160)	–	–	–	3.25	16.25	–
PMC	(400)	5.35	14.04	26.69	3.35	16.75	32.95
PJB	(400)	4.39	13.08	21.95	–	–	–
PPF	(400)	5.45	14.09	27.25	3.35	16.75	32.95
New! PJM	(640)	4.79	13.48	23.95	–	–	–
New! PMZ	(1000)	–	–	–	3.59	17.95	–
PJC	(1600)	5.99	14.68	29.95			

Bulk 100'
Kodalith
6556 ..... 34.95
5072..... 67.39
5325..... 81.85
VPS 41.95
PMC..... 44.95
New Ready Bulk Pack (100)
VPS-120..319.95
VPS-220..639.95
PMC-120 .329.95
PMC-220 .649.95

PRO SLIDE FILM USA *35mm 120/220*

	ASA	135-36	36X w/KODAK PROC.	36X . w/FUJI PROC	120 Single	120 ProPak	220 ProPak	Bulk 100'
PKM	(25)	7.37	11.66	-	–	–	–	–
EPY	(64)	6.99	11.28	10.08	3.79	–	–	79.95
EPR	(64)	7.09	11.38	10.18	3.89	19.45	38.75	79.95
PKR	(64)	7.25	11.54	-	–	–	–	–
EPN	(100)	7.49	11.78	10.58	4.29	21.45	42.45	84.95
EPP	(100)	6.99	11.78	10.58	4.10	20.49	39.95	84.95
E100 S	(100)	7.99	12.28	11.08	4.39	21.95	42.95	104.95
E100 S	(100)	135-36 20 Pack		153.50				
E100 SW	(100)	7.99	12.28	11.08	4.39	21.95	42.95	104.95
E100 SW	(100)	135-36 20 Pack		153.50				
EPT	(160)	8.55	12.84	11.64	4.75	23.75	–	84.95
EPD	(200)	8.49	12.78	11.58	4.59	22.95	46.49	84.95
PKL	(200)	8.75	13.04	-	–	–	–	–
EPJ	(320T)	9.29	13.58	12.38	–	–	–	–
EPL	(400)	8.79	13.08	11.88	5.95	– 29.75	–	109.95
EPH	(1600)	10.59	14.88	13.68	–	–	–	–
5071	(DUP)	6.19	10.48	9.28	–	–	–	37.95
HCS	(EKTA)	4.95	9.24	8.04	–	–	–	–
S0366		6.49	10.78	9.58	–	–	–	57.99
S0279		6.49	10.78	9.58	–	–	–	–
IE		16.99	–	–	–	–	–	–

BLACK & WHITE FILM USA *35mm Prof. 120/220*

	ASA	135 24	135 24 Proc.	135 36	135 36 Proc	120	120 PP	220 PP	Bulk 100'
PX	(125)	2.57	8.86	3.59	12.28				
PXP	(125)	–	–	–	–	–	12.49	25.50	30.95
TXP	(320)	–	–	–	–	–	13.39	24.50	–
TX	(400)	2.49	8.78	3.49	12.08	2.49	–	–	33.95
TMX	(100)	2.69	8.98	3.59	12.28	2.49	12.45	–	35.95
TMY	(400)	2.87	9.16	3.95	12.64	2.59	12.95	–	36.95
TMZ	(3200)	–	–	4.40	13.09	–	–	–	79.95
TP	(Copy)	–	–	5.79	–	4.49	–	150'→	56.69
HIE		–	–	7.49	–	–	–		

DISPOSABLE CAMERAS

KODAK Fun Savers
Fun Saver 4.79 w/Flash 8.49
Panoramic 6.75 Weekend 8.99
Wedding Pack (5) 39.95
Fun Saver APS w/Flash 15.49

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Outdoor 4.99 w/Flash 8.29
Super 800 6.95 w/Flash 11.95
Panorama 7.69 w/Flash 13.99
Water Proof 9.79

Konica
Film-In 4.99 w/Flash 8.49
Film-In APS w/Flash 12.99

AGFA APS FILM
Wedding Pack 34.95
Ocean Water Proof 8.99
Easy APS 8.99 w/Flash 12.99

ILFORD
XP2 (B&W) w/Flash 9.95

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Time Zero (SX70) (10)..... 10.50
Spectra HD (10)..... 9.25
600 HD (10)..... 8.99

INSTANT PACK FILM 3¼X4¼
88 Single (8)..... 9.80
665 Single (8)..... 8.89
667 Single (10)..... 7.99
Pro 64T Twin (16)..... 19.95
Polacolor Pro 100 679 Twin (16)..... 16.98
Polapan Pro 100 / 664 Twin (20)..... 16.98
New Polapan 400 / 672 Twin (20)..... 21.95
Fuji FP 100C (10)..... 12.99
108 Single (8)..... 9.99
669 Single (8)..... 9.19
691 Single (8)..... 12.59
Pro Vivid 689 (10)... 13.99

PACK FILM 4x5 (Images)
552 (8)..... 14.49
553 (8)..... 14.19
559 (8)..... 21.65
552 Bulk (240) 404.95
554 (8)..... 14.25
559 Bulk (240)..... 599.95

PRO 4x5 Instant Film (20 / 200)
52..... 34.09 / 319.
53..... 35.95 /
55..... 35.60 / 339.
57..... 34.75/ —
Polacolor 64 T 56.75/
Polapan 400..... 35.50/329.
54..... 35.49/329.
New! 56 (Sepia) 43.95/ —
59 ..... 53.95 / 499.
79 ..... 53.90 / 509.

SHEET FILM 8x10 (Images)
803 (15) 119.95
809 (15) 119.95
804 (15) 119.95
809 (45)..... 329.00

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35mm Power Processor 233.95
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Slide Mounts (100) 5.99
Image Transfer Kit 34.95
Vivitar Slide Printer 89.95
Free Polaroid 669 twin w/ above Purchase

POLAROID INSTANT SLIDE FILM

	135-12	135-36
Polagraph(HC)	10.09	—
Polapan(CT)	9.69	15.49
Polachrom(CS)	10.69	15.49
HCP chr(HCP)	11.49	—
Polablue(BN)	11.69	—

RELOADABLE CASSETTES
Kodak Ea. .99 100 pcs. 93.95
Plastic Ea. .45 100 pcs. 39.95
Metal Ea. .32 100 pcs. 29.95
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WATSON Bulk Loader 15.95
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Alden Bulk Loader 29.95

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Film Leader Retriever 4.95
Cassette Labels (25) 2.50
X-Ray Film Shield (22) 10.95
X-Ray Film Shield Jumbo (60) 19.95
Cordura Film Guard (60) 32.95

Scotch 3M

Color Slide Film	135-36	w/Proc.
Scotch 100	3.39	6.68
Scotch 400	4.99	8.48
Scotch 640 T	6.49	9.98

AGFA APS FILM

AGFAPAN (B&W)

Agfapan	135-36	120	100'Bulk	4x5 25
APX 25	3.19	2.05	—	—
APX 100	2.99	2.05	23.95	11.95
APX 400	2.99	2.19	23.95	—
Ortho 25	3.19	-	—	10-Sh.
Scala 200	8.69	5.39	—	16.95
Scala Mailer (36/120)			5.99	—

AGFACHROME

RSX Chrome	135-36	120	220PP	Bulk 100	4x5 50
RSX 50	5.19	3.39		—	59.95
RSX 100	5.75	3.79	.	71.95	64.95
RSX 200	6.59	4.29		—	
RS 1000	10.49	-		—	
CTX 100	4.79	-		—	
CTX 200	5.19	-		—	

AGFACOLOR

Print	135-24	135-36	120	220	PP	4x5 10	Bulk 100
HDC100	2.39	3.39	—	—	—	—	—
HDC200	2.49	3.89	—	—	—	—	—
HDC400	2.79	4.25	—	—	—	—	—
Optima100	3.39	4.49	3.09	—	—	15.75	45.95
Optima200	3.79	5.09	3.05	—	—	—	—
Optima400	4.19	4.99	3.59	31.50	—	45.95	
Ultra50	3.49	4.29	3.29	—	—	—	
Portrait160	3.49	4.29	3.09	31.50	—	—	

NEW APS CAMERAS & FILM

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Minolta Vectis
40 Call 25 Call
20 Call 10 Call
51 Call UC Call
Nikon Nuvis
125 Call 125 i Call
75 169. 75 i 189.
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Yashica Acclaim
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Elph Call
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EOS IX KIT Call

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Konica
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Super Big Mini Zm 149.95
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Kodak Advantix
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3200 Auto 72.95
3600 IX 128.95
4100 IX 149.95
5600 MRX Call

Olympus
Centurion 100 Call
Newpic Zoom 60 Call

FILM

KODAK ADVANTIX		AGFA FUTURA		FUJICOLOR SMART	
100 15 Exp.	2.89	100 15 Exp.	2.99	DN 100 15 Exp.	2.60
100 25 Exp.	3.79			DN 100 25 Exp.	3.49
200 15 Exp.	3.35	100 25 Exp.	3.99	DN 100 40 Exp.	4.55
200 25 Exp.	4.35	100 40 Exp.	4.89	DS 100 15 Exp.	3.39
200 40 Exp.	5.75	400 15 Exp.	3.79	DS 100 25 Exp.	4.39
400 25 Exp.	4.85			DS 100 40 Exp.	5.79
ADVANTIX PROFESSIONAL		400 25 Exp.	4.89	DA 200 15 Exp.	3.09
200 40 Exp.	6.19	400 40 Exp.	5.99	DA 200 25 Exp.	3.95
200 40 PP(5)	30.95			DA 200 40 Exp.	4.99
				DH 400 15 Exp.	3.39
				DH 400 25 Exp.	4.39
				DH 400 40 Exp.	5.79
				KONICA JX	
				JX-400 15 EXP.	3.09
				JX-400 25 EXP.	3.95
				JX-400 40 EXP.	4.99

MAILERS

KODAK APS MAILERS		FUJI APS MAILERS	
APS-15 EXP.	8.15	APS-15 EXP.	7.75
APS-25 EXP.	9.60	APS-25 EXP.	9.29
APS-40 EXP.	14.85	APS-40 EXP.	13.79

FUJI FILM

FUJICHROME PROFESSIONAL SLIDE FILM

	ASA	35mm 36X	36X w/Processing by Fuji	by Kodak	120	220	Bulk 100'
RVP Velvia	(50)	5.75	8.84	10.04	3.40	7.39	78.95
RTP	(64)	5.49	8.58	9.78	3.59	–	72.95
RDP	(100)	6.39	9.48	10.68	3.99	7.69	79.95
RDP II Provia	(100)	5.89	9.08	10.18	3.19	7.49	77.95
RHP Provia	(400)	6.79	9.88	11.08	5.19	–	102.89
RSP Provia	(1600)	9.39	12.48	13.68	–	–	–

Fujichrome RVP Velvia 135-24 . 4.65 24X w/Proc. 8.02

FUJICOLOR PRINT FILM

	ASA	35mm 24	35mm w/p	36x	w/p	Roll Film 120	Roll Film 220	100' Bulk
CN	(100)	1.70	7.99	1.87	10.56	—	—	—
Super G Plus	(100)	2.39	8.68	2.89	11.58	2.84	—	—
CA	(200)	1.95	8.24	2.25	10.94	—	—	—
Super G Plus	(200)	2.75	9.04	3.49	12.18	—	—	—
CH	(400)	2.25	8.54	3.25	11.94	2.19	—	—
Super G Plus	(400)	3.35	9.64	3.94	12.63	—	—	—
Super G Plus	(800)	—	—	4.69	13.38	—	—	—
CU	(1600)	3.09	9.38	4.59	13.28	—	—	—
CS Reala	(100)	2.55	8.84	3.15	11.84	2.39	5.99	—
New Reala	(100)	2.95	9.24	3.69	12.38	—	—	—
FUJICOLOR PRO PRINT FILM								
NPS	(160)	—	—	3.89	12.58	2.59	5.84	39.95
NPL	(160)	—	—	—	—	3.09	—	—
NPH	(400)	—	—	3.99	12.68	2.75	6.70	—
NHG	(400)	—	—	5.39	14.08	3.29	6.56	—
FUJI PRO BLACK & WHITE FILM								
Neopan	(100)	-	-	1.95	10.64	-	-	-
Neopan	(400)	-	-	2.44	11.28	2.25	-	31.95
Neopan	(1600)	-	-	3.49	12.18	-	-	-
CDU Duplicating		-				-	-	39.69
ITN Internegative		-				-	-	70.95

Fuji Professional

SHEET FILM		4x5 10	4x5 50	8x10 10	8x10 50
RVP Velvia	(50)	17.39	79.95	65.49	291.95
RTP	(64)	15.35	70.95	57.95	270.95
RDP II Provia	(100)	17.49	78.90	64.95	299.95
NPS	(160)	15.29	69.95	56.95	–
NPL	(160)	15.39	69.95	56.95	–
CDU Duplicating		–	64.95	–	239.49
ITN Internegative		16.89	74.95	61.95	278.95

FUJI QUICK LOAD
Fuji Quick Load Film Holder..... 104.95
RDP II Provia ..... 47.95 RVP Velvia 49.95
RTP 64T..... 48.95

FUJICHROME SLIDE FILM *35mm*

	ASA	24X 24X w/Proc.	36X	36X w/Processing by Fuji	by Kodak
RD Sensia	(100)	2.59 5.98	3.49	6.58	7.78
RM Sensia	(200)	3.35 6.74	4.99	8.08	9.28
RH Sensia	(400)	4.59 7.96	5.45	8.58	9.74

ILFORD

35mm	ASA	24 Exp.	36 Exp.	120	Bulk 100'
PanF Plus	(50)	—	2.99	2.10	29.49
FP4 Plus	(125)	1.95	2.55	1.99	25.95
XP-2	(400)	2.49	2.99	1.90	32.49
HP-5 Plus	(400)	1.89	2.59	1.90	28.95
Delta	(100)	2.39	3.27	2.49	35.49
Delta	(400)	2.49	3.27	2.49	35.49
New SFX 200	Infrared	6.99			

ILFORD SHEET FILM

		4x5 25	4x5 100	8x10 25	220 ProPak
FP4 Plus	(125)	14.95	54.95	47.95	24.50
HP5 Plus	(400)	14.95	54.95	47.95	24.95
XP-2	(400)	14.90	57.89	49.79	—
Delta 100	(100)	14.95	56.95	48.95	—
Delta 400	(400)	15.95	58.95	51.95	25.95
ORTHO		11.99	—	41.95	—

Konica

Print Film	24X	w/Proc.	36X	w/Proc.	120
Super XG 100	1.70	8.28	1.99	10.68	2.55
Super XG 200	2.29	8.78	2.99	11.68	
Super XG 400	3.09	9.38	3.99	12.68	3.11
ProPrint					
SRG 160	3.19	9.48	4.09	12.78	2.69
SRG-3200	6.99	13.28	7.99	16.68	6.49
Impresa (50)	3.85	10.14	4.85	13.54	3.59
Infrared 750	5.39				6.85
SRG 160 220 PP	24.95			Chrome R 100 Film - 36X	3.39

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Film

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SNOW-YAKING:

Kayakers may be a bizarre bunch, but most of them can wait for the rivers to thaw in the spring. Damon Gold, however, had a mid-winter itch that just couldn't wait. He phoned photographer Simone and asked if she wanted to get a little "snow-yaking" on film. Up on the notorious Donner Summit in Colorado, where it had been snowing regularly for weeks, Gold donned a spray skirt, picked up his paddle and prepared to come up with a new definition of an Eskimo roll while Simone set up across the bowl. As he came flying off the cliff, she fired off a series of shots, culminating with a "splash" at the bottom.

Canon EOS-1N, Canon 200mm *f*/2.8 L USM, Kodak Lumiere

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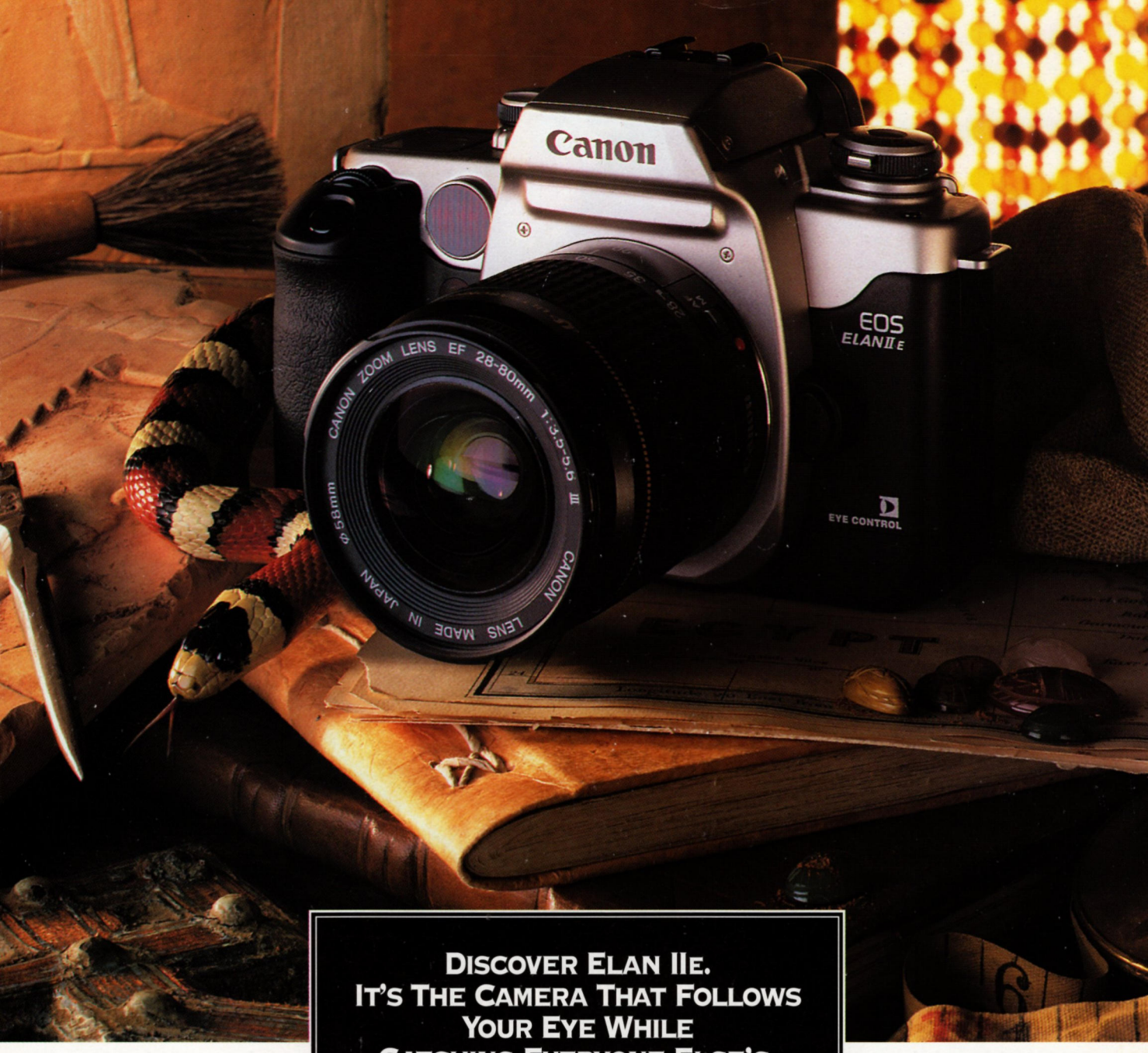

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Now look to your right. That AF frame comes into focus just as easily. No complicated dials, no computations. Simply calibrate your Eye Controlled Focusing System once and let Elan IIE do the work.

Now you can shoot off-center subjects like a pro with no need to focus, lock and recompose. So when an unexpected moment occurs while you're shooting, even if it's off-center, you have the technology to capture it.

And Eye Controlled Focusing works bi-directionally. So whether you hold the camera horizontally or vertically, three-point autofocus is at your disposal. Elan IIE is also equipped with an advanced, built-in flash and Canon's one-of-a-kind Whisper Drive™ film rewind system.

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